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This document contains six studies concerned, primarily, with the effect of maternal influences and attitudes on preschool children. The subjects were lower class Negroes, whites, and Seminole Indians. The titles of the studies and the accession numbers of the individual abstracts are as follows: (A) Maternal Influences Upon Development of Cognition (PS 001 238), (B) Maternal Antecedents of Intellectual Achievement Behaviors in Lower Class Preschool Children (PS 001 239), (C) Cognitive Interaction Between Teacher and Pupil in a Preschool Setting (PS 001 240), (D) The Interaction of Intelligence and Behavior as One Predictor of Early School Achievement in Working Class and Culturally Disadvantaged Head Start Children (PS 001 241), (E) Comparative Use of Alternative Modes for Assessing Cognitive Development in Bilingual or Non-English Speaking Children (PS 001 242), and (F) Socialization into the Role of Pupil (PS 001 243). (WD)

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HEAD START EVALUATION AND RESEARCH CENTER

ANNUAL REPORT, 1966 - 1967

(OEO Contract Number 1410)

TO: INSTITUTE FOR EDUCATIONAL DEVELOPMENT
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NEW YORK, NEW YORK

FROM: VIRGINIA C. SHIPMAN, PH. D.
ACTING DIRECTOR

THE UNIVERSITY OF CHICAGO

NOVEMBER 30, 1967

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Archdiocese of Chicago Board of Education
Head Start Director: Mr. Frank O'Malley
Curriculum Director: Sister Mary Mel

Holy Trinity School
Principal: Sister Eugene
Head Teacher: Sister M. Hedwig

Robert Taylor Homes Child Development Center
Head Teachers: Sister Joan and Mrs. Brewster

St. Ambrose School
Principal: Sister Parnis
Head Teacher: Sister James Anne

St. Mary of The Lake
Principal: Sister Agneda
Head Teacher: Sister Anne

Chicago Public Schools - Board of Education
Head Start Director: Miss Helen Bradley

Columbus School
Principal: Mr. Orenstein
Head Teacher: Miss Harlan

Mark Sheridan School
Principal: Mr. Donahoo
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Medill School
Principal: Mrs. M. Potnick
Head Teachers: Mrs. Hines and Mrs. Fimoff

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Principal: Mr. Gardiner
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    Indiana Analysts: Miss Dunlap and Mr. Cane

Orange County Economic Opportunity, Inc.
    Director: Mr. James R. McKay
    Head Start Coordinator: Mrs. Elaine Cox

    Tangerine Center
        Center Director: Mrs. Ferguson
        Head Teachers: Mrs. Bayer and Miss Frank

Seminole Tribe of Florida
    CAP Director: Rev. Billy Osceola
    Asst. to the Director: Mr. Richard Taylor
    Head Start Coordinator: Mrs. Ferguson

    Hollywood, Florida Center
        Head Teacher: Mrs. Winters

    Big Cypress Center
        Head Teacher: Mr. Ronald Meertz

Southeast Indiana Economic Opportunity Council
    Director: Mr. Conover
    Head Start Director: Mr. Paul Fletcher

    Moore's Hill Center, Indiana
        Head Teacher: Mrs. Stevenson

    Versailles Center, Indiana
        Head Teachers: Mrs. Matthews and Mrs. Porter

    Vevay Center, Indiana
        Head Teacher: Mrs. Furnish

    Rising Sun Center, Indiana
        Head Teachers: Mrs. Clingerman and Mrs. Royce

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We would also like to acknowledge, with thanks, the generous cooperation we received from the families who were subjects in our research and evaluation activities. It was a great pleasure to meet the children and their families who participated in this study.

In addition, we would like to convey our pleasure at having the opportunity this past year to work with the other E and R Centers. The diversity of opinions and experiences expressed coupled with directed efforts toward collaboration and mutual sharing of knowledge were a continuing source of stimulation to our own thinking. We would, therefore, like to express thanks at this time to the following Head Start Evaluation and Research Center Directors for their contributions towards making this a more challenging and exciting year:

Dr. Dorothy Adkins, University of Hawaii
Dr. Theron Alexander, Temple University
Dr. Myles Friedman, University of South Carolina
Dr. Frank Garfunkel, Boston University
Dr. Sarah Hervey, Michigan State University
Dr. Edward Johnson, Southern University
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Dr. Herbert Zimiles, Bank Street College

Finally, I would like to personally express my gratitude to the loyal staff enumerated in the following section. Despite severe snowstorms, dirt roads, incredible testing conditions and other vicissitudes involved in action research, they made repeated trips to schools and homes to gather the information contained in this report. Although asked to continually adapt to new procedures, understand decisions sometimes accompanied by minimal rationale, they willingly gave their support, assistance and cheer for which I am extremely grateful.

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In summary, we appreciate the opportunities offerred us by the establishment of an E and R Center at the University of Chicago. The past year's activities have contributed to the growth of our faculty, staff and students by: 1) providing them rich and varied experiences including better acquaintance with people of varying backgrounds; 2) facilitating the development of clearer insights into problems of research on early learning and the validity of our assessment procedures; and 3) enabling our University to become even more deeply committed to working on the social problems in our land.

CENTER PERSONNEL

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Cynthia Kocher, Secretary for the Center until May, 1967

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*It should be noted that Dr. Robert D. Hess, formerly Professor of Education and Human Development and Director of the Urban Child Center at the University of Chicago, was the initiator and principal investigator for this contract. Prior to contract negotiations, however, Dr. Hess left campus for a year's leave of absence. Although returning in July, 1967, he left permanently in September of this year to become Lee Jacks Professor in Early Childhood Education at Stanford University.

REPORT ON RESEARCH

A. Maternal Influences Upon Development of Cognition

Principal Investigators: Robert D. Hess and Virginia C. Shipman
Project Director: Jere E. Brophy

This project was designed to follow up a group of 163 mothers and their four-year-old children who were subjects in a study of cognitive environments of urban preschool children. That study is now in the final write-up stage and deals with the socialization of cognitive behavior in preschool Negro children from both middle class and disadvantaged urban backgrounds. The theoretical issues are 1) the effects of early experience (especially cultural deprivation) upon emergence of cognitive ability; 2) the role of the mother in socializing cognitive behavior and achievement motivation; and 3) the role of linguistic styles and techniques of maternal control as mechanisms of exchange between culture and cognition.

The initial project focused upon the input features of the socialization process, especially those provided by the home context. The behavior of the mother, particularly in interaction with the child, provides (or fails to provide) the child with response repertoires of various kinds (linguistic, conceptual, motivational, et cetera), which are particularly appropriate for successful performance in a school setting. The project utilizes the concepts of communication modes, which may be elaborated or restricted, family control systems, which may be oriented toward norms, persons, or toward rational consequences, maternal teaching style, viewing the mother as a teacher and programmer of input, and educability, which is a heuristic term to indicate the confluence of cognitive skills, motivation for academic achievement, and socialization into the role of pupil in response to preschool maternal behavior and other features of the home environment. In this initial study, the central focus of the interview, testing and laboratory analysis of mother-child behavior and interaction was upon the cognitive components of maternal behavior. Research on mother-child interaction in the child's early years traditionally has ignored cognitive elements, concentrating on affective and disciplinary types of exchange within the mother-child dyad.

The basic study included 163 Negro mothers and their four-year-old children. This group was divided into four subgroups of approximately forty each, drawn from professional and managerial occupational levels (Group A), skilled work occupational levels (Group B), unskilled and semi-skilled occupational levels (Group C), and an additional group (D) from unskilled and semi-skilled occupational levels of mothers who were on public assistance. This last group was also one from which the fathers were absent - a condition that in the past has been a basic requirement in order to receive public assistance in the city of Chicago. These mothers were interviewed in the homes about their activities with the child, their daily schedules, the availability of cognitive and intellectual stimulation, and other features of the home environment that are thought to be related to cognitive development. Mother and child were then brought to the University for testing. Tests of intellectual ability and cognitive styles were given to both the mother and the child. In addition, they were asked to engage in an interaction situation which required that the mother teach the child three simple tasks that she had been taught by a project staff member. These mother-child teaching situations were observed through a one-way screen and were recorded on tape. The performance of the child was measured by the degree to which he was able to master the tasks presented by the mother. A number of reports are available from the project describing the theoretical rationale and findings in detail.

Summarizing the results, the data seem to indicate that the structure of the social system and the structure of the family shape communication and language and that language shapes thought and cognitive styles of problem solving. It appears fruitful to consider class differences in terms of differences in the availability of options in the mother's daily life. The lower-class mother's narrow range of alternatives is being conveyed to the child through language styles which convey her attitude of few options and little individual power and this is now being reflected in the child's cognitive development. A problem-solving approach requires reflection and the ability to weigh decisions, to choose among alternatives. The effect of restricted speech and a status orientation is to foreclose the need for reflective weighing of alternatives and consequences: the use of an elaborated code with its orientation to persons and to consequences tends to produce a cognitive style more easily adapted to problem-solving and reflection. The cognitive environment of the culturally disadvantaged child can be described as one in which behavior is controlled by status roles rather than attention to the individual characteristics of a specific situation and one in which behavior is not mediated by verbal cues which offer opportunities for using language as a tool for labelling and ordering stimuli in the environment nor mediated by teaching that relates events to one another and the present to the future. This environment produces a child who relates to authority rather than to rationale, who although often compliant is not reflective in his behavior, and for whom the consequences of an act are largely considered in terms of immediate punishment or reward rather than future effects and long range goals.

The follow-up study has as objectives: 1) the expansion of the investigation of cognitive input features of the home by the development of techniques for extending the study of mother-child interaction from previous laboratory studies to naturalistic observation in the home and/or school; 2) the prediction of the child's cognitive development and school achievement during the first three years of school, using data from the preschool years; and 3) the longitudinal analysis of the growth of cognitive abilities over these years. The limited vocabulary and conceptual development of the four-year-old child made it difficult to obtain adequate measures of cognitive and motivational behavior in the initial study. For this reason the procedure calls for retesting the children and mothers again before the child starts his first year of school and for subsequent testings during the first three years of elementary school experience. Because the original testing was spread out over a period of almost two years, the follow-up project requires considerable time to gather data on the children who participated in the study.

The prediction aspects of the study employ a range of cognitive measures -- Stanford-Binet I.Q.; several Piaget-type tasks assessing the child's capacity to distinguish external reality from subjective appearance under conditions of varying perceptual distortion (conservation of length, number and volume, generic constancy, class inclusion, ring-segment, dream interview); the Sigel Sorting Task to assess cognitive style; several measures of "impulsivity" (ability to sit still, one of Mischel's delayed reward questions, Kagan's Matched Figures Test to assess reflectiveness, and the Draw-a-Circle Slowly Task); the Lee-Clark Reading Readiness Test (or first grade test for the older children); and an experimental visual measure of preference for stimulus complexity developed in the initial study, as well as orientation toward school as expressed in teacher's grades and other measures of ability to cope with the social and authority relationships presented at school. Instructions for these tasks are given in the Appendix.

Additional data were obtained from the mothers, including present attitudes about her child's school experiences and measures of I.Q., reflectiveness, flexibility of thought, and motivational variables thought to be particularly relevant to those maternal behaviors assessed earlier. The WAIS Performance subtests (excluding Object Assembly) and Vocabulary subtest were administered to the mothers. (Verbal I.Q.'s had been previously obtained.) They were also asked to "draw a circle slowly" and were given a version of Kagan's measure of reflectiveness for older subjects. The items from the Need for Achievement, Need for Change, and Need for Introception and Need for Nurturance scales of the Edwards Personal Preference Record were read to all the mothers as was the James-Phares Locus of Control Scale, since many have a limited reading ability. Flexibility of thought, as measured by the Getzels-Jackson Verbal Uses Test, was also assessed. In addition, each mother-child pair was observed through a one-way screen for 15 minutes in a controlled free play situation to add to our previous laboratory measures of mother-child interaction (e.g., amount of maternal control, pressures for obedience, orientation to the task, specificity of information given) and to provide a measure of the child's manipulatory curiosity, initiatory behavior, and complexity of play. An overhead mike recorded the mother's and child's speech and the observer spoke into another synchronized tape recorder giving a running account of the mother's and child's actions.

Concentrated testing prior to entrance into first grade had already been funded, but additional funds were needed for coding and analyzing these data, for testing in the Chicago Public Schools in the autumn of 1966, for obtaining additional data during the year concerning the child's school records, and maintaining contact with our research group. Although we submitted a proposal to OEO for separate funding of this project, delays in the decision-making and budgeting process necessitated using a substantial portion of the E and R budget to continue operation of this project. Since this project is an ongoing one, with continued testing of the children at least through 1967-1968, the following is a progress report of work done to date rather than a final report.

In the summer of 1966, those children who were entering first grade in the fall were brought to the University with their mothers where both were administered the instruments described above (N=101). During December and January each seven-year-old subject (N=56) was seen at his school and given a Stanford-Binet Intelligence Test (Form LM) and a doll-play measure designed to tap attitudes toward the school and the child's perception of his role in the school milieu. Cooperation was obtained from every school involved, both in providing testing space and in approving release of school records of the children. (During prior home interviews with their mothers we secured signed parental permission for testing their children at school and obtaining the school records.)

In the summer of 1967 data collection for the first follow-up cycle (the summer before the child's entrance into first grade) was completed with the interviewing and testing of the remaining mothers and children at this level. An additional 102 mothers and children were seen for the second follow-up cycle during the summer, and this data collection is complete except for the five children who are presently in first grade. WAIS subtests were not readministered to the mothers since I.Q.s may be expected to remain fairly constant for adults over this three-year time span. Fifty-three of the original fifty-seven eight-year-olds were also brought to the University for readministration of the follow-up tasks with the exception of the Lee-Clark. Beginning in September and continuing through the present, all seven- and eight-year-old subjects are being seen at their school and given the Stanford-Binet and the doll-play interview. We expect to complete this testing in February. At that point only the collection of school grades and other data in June will remain for the completing of the second cycle (except for the five first grade children mentioned above).

Considering the lack of specific details collected earlier concerning our families, (e.g., name of father's employer), we were fortunate to have been able to locate essentially all our subjects when we started the follow-up testing. We now have contact with 160 of the original 163 subjects in the sample (one child died and two we have been unable to find). With the exception of five families who moved out of state (only one of whom we have been unable to locate and test) all reside in Chicago or a Chicago suburb.

Most of the data from the first follow-up cycle are in final form and are ready for analysis. The only exceptions are the Piaget conservation data and the play period observations, which are presently being coded and should be ready for analysis shortly. Scoring criteria for the Piagetian tasks are being finalized in collaboration with Dr. Lawrence Kohlberg.* Analysis of the other data is already under way and will be summarized in a report to OEO to be prepared by March 1. This report will include:

a. Discussion of the usefulness of variables measured during the preschool study (when the children were age four) as predictors of the measures of the children at the first follow-up cycle (before first grade). These predictor variables include both maternal and child behaviors assessed at that time.

b. Longitudinal data concerning stability over time on the curiosity measure (preference for visual complexity) and change over time on the Sigel Conceptual Sorting Task from age four to age six, thereby contributing to our knowledge about the continuity and sequence of growth.

c. Methodological discussions concerning the newly-developed or experimental measures on the children (Piagetian conservation tasks, impulsivity measures, Sears sex role preference instrument). Questions posed include the assessment of the degree to which the conservation tasks approach a hierarchically arranged Guttman scale in level of difficulty and the relationship between disparate "impulsivity" measures.

d. Mother-child similarity on equivalent measures (Kagan, Draw a Circle, Cognitive Sorting Tasks).

*It should be noted that Dr. Irving Sigel, Director of Research at the Merrill-Palmer Institute, gave willingly of his time to discuss any scoring problems that arose with the data from the Sigel Cognitive Sorting Task.

Table 1 presents the social class means and standard errors for the Follow-up I variables, while Tables 2 and 3 present the intercorrelations among the maternal and child variables, respectively. These preliminary analyses of the data indicate that some variables do not discriminate at all by social class while others show extreme and progressive differences from the middle through the ADC groups.

Among the mother measures, average reaction time and number of errors on the Kagan, the anxiety score of the brief anxiety and depression scale, some of the Edwards scales, and the James-Phares Locus of Control measure all show a clear progression by social class in the mean levels. This is also true of the depression score from the brief anxiety and depression scale, since even though the means do not differ by very much the differences appear to be quite significant in view of the low variability. Among the Edwards scales, some social class trends are striking and in accord with expectation (such as the change and introception scale), while others have trends in the direction opposite to what had been expected (achievement and nurturance scales). The maternal I.Q. data is consistent with previous research findings with the middle-class mothers being slightly higher in verbal I.Q. and the lower-class mothers slightly higher in performance I.Q. These differences do not approach significance except in the case of the ADC mothers where performance I.Q. is four points higher than verbal I.Q.

The child data is less clear as there are few significant correlations among the various tasks. Moreover, among the impulse control measures three impulsivity measures (draw a circle slowly, gross motor control, and delayed reward) are unrelated to one another.

The difficulty with the gross motor control measure seems to lie in the measure itself, in that the great majority of the children were scored for 180 seconds, since they did not talk or leave their chair for full three minutes, and only a few were scored for less than 180 seconds. As a result the variable shows no class differentiation and no correlation with other measures. It is clear that this variable at least in its present form will be of little use. The draw a circle slowly measure, presumably reflecting the ability to control movement on demand, shows class trends and correlates with several other variables. The delayed reward measure must be counted as enigma at the moment. Although there is good differentiation between and within groups (45% of the children chose the delayed large reward while 55% opted for the small immediate reward), the correlations with other variables are quite low and usually not significant. This suggests that this variable is unique and is not simply another measure of general cognitive development. As has been suggested by others, it may also be a measure of trust, differential understanding of "later" and differential reinforcement value of the stimulus. The Kagan data for the child as well as for the mother support the interpretation of the reaction time measure insofar as they go. That is, the errors total seems to be more a measure of ability to do the task and correlates higher with I.Q. and with variables that correlate with I.Q. The reaction time measure correlates the same way (in opposite directions) but at a lower level, which is consistent with the interpretation of this measure as an index of cognitive styles (reflective-impulsive) as opposed to problem solving ability. However, the apparent methodological confusion in the measurement of the inhibition of impulse expression clouds the issue of the necessary relation of impulse control to the further development of thinking.

On the Sears Sex Role Preference Test the girls made more same sex choices among the pictures presented than the boys. We need normative data on the instrument itself before we can safely interpret this correlation, since it may simply represent a differential appeal in the stimuli which would cause girls to have higher scores rather than a true difference in sex role preference. The curiosity data, (visual preference for stimulus complexity), as in the pre-school analysis, shows little if any correlation with other variables. However it does show an interesting differentiation of the ADC children (along with many of the other variables also), with the ADC child spending considerable less viewing time. When the child data in general is scanned, it is clear that there has been a shift in the relative positions of the three lower-class groups with the upper-lowers and lower-lowers now being very similar on most measures and the ADC's being different from both of them (to greater or lesser significance on various measures).

The Lee-Clark and Sigel scorables measures behave as expected. However, the total scorables measure is less useful as a single index of ability than it was at the pre-school level, since the number of scorables now is much higher and there is little differentiation. The number of scorable responses obtained and the differential pattern by social class in these responses now allows us to make more clear-cut statements about categorization behavior as a cognitive style.

As mentioned above, these are but preliminary findings. When analyzed separately by sex of child and for the three lower status levels combined, other trends may appear. Moreover, there may be sex by social class interactions as, for example, in differential sex role preferential patterns for boys in father-present and father-absent lower class homes. The principal data analyses remain to be done to answer the prediction and longitudinal questions raised earlier.

Although exhaustive analysis of relationships between home environment variables obtained when the child was four and child data at age six had not yet begun, preliminary findings with the reading readiness scores suggest that the pattern will be similar to our previous findings with the child's preschool performance. It appears that our selected maternal measures will prove to be useful predictors of reading readiness and other follow-up cognitive measures of the children.

Project activity in the coming quarter will include completion of the intelligence testing and doll-play interviewing with the second grade children, preparation of second follow-up data for analysis, and possibly the beginning of the analysis fo these data. Investigation of the second follow-up cycle data will follow the organizational pattern outlined above for the first cycle, although there will be considerably more longitudinal data since many more measures will have been administered twice. Data from the Piagetian tasks are especially suitable for longitudinal analysis as the theory asserts an inherent sequence in the rules of logic by which children solve problems. It also will include data from a follow-up interview which contains information on changes in the families since the original interview and on the child's school-relevant activities before the first grade.

TABLE 1
MEAN PERFORMANCE ON THE FOLLOW-UP I VARIABLES ACCORDING TO SOCIAL STATUS LEVEL

	SOCIAL STATUS LEVEL											
	MIDDLE			UPPER-LOWER			LOWER-LOWER			ADC		
VARIABLE	N	MEAN	S. ERROR	N	MEAN	S. ERROR	N	MEAN	S. ERROR	N	MEAN	S. ERROR
Maternal:												
Draw Circle Slowly (Time in seconds)	39	41.49	9.124	41	42.76	5.099	36	48.58	7.369	39	30.54	3.583
Kagan Avg. Rtn. Time	39	14.93	1.038	41	12.92	0.979	36	12.71	0.877	39	11.12	0.778
Kagan # Errors	39	9.64	0.894	41	11.37	0.767	36	14.36	1.134	39	14.13	1.089
Anxiety Score	39	4.69	0.566	41	6.95	0.660	36	8.42	0.583	39	11.13	0.888
Depression Score	39	9.69	0.325	41	10.54	0.360	36	10.69	0.382	39	10.62	0.412
Edwards N-Ach.	37	13.51	0.656	41	14.37	0.551	36	14.92	0.658	38	14.71	0.529
Edwards N-Introception	38	17.29	0.605	41	15.20	0.622	34	15.59	0.622	37	15.38	0.620
Edwards N-Change	38	17.79	0.675	41	14.20	0.655	32	13.84	0.563	37	12.57	0.681
Edwards N-Nurturance	38	14.58	0.619	40	16.28	0.694	35	15.97	0.674	37	16.73	0.764
James-Locus of Control	11	37.82	1.762	10	45.50	3.673	19	51.95	1.894	16	51.62	1.316
WAIS Verbal IQ	40	109.40	1.770	42	91.79	2.138	40	82.48	2.148	41	82.42	2.125
WAIS Performance IQ	39	107.20	1.585	40	92.65	2.186	36	83.56	2.334	39	86.67	2.510
WAIS Full Scale IQ	39	109.33	1.568	40	91.80	2.122	36	82.08	2.279	39	83.82	2.271

TABLE 1 - CONTINUED

VARIABLE	SOCIAL STATUS LEVEL											
	MIDDLE			UPPER-LOWER			LOWER-LOWER			ADC		
	N	MEAN	S. ERROR	N	MEAN	S. ERROR	N	MEAN	S. ERROR	N	MEAN	S. ERROR
Child:												
Draw Circle Slowly (Time in seconds)	39	22.74	2.500	37	17.84	1.777	37	19.35	2.095	40	17.70	1.939
Gross Motor Control (Time in seconds	39	167.92	6.063	37	164.43	7.666	37	168.54	6.656	40	168.55	5.849
Delayed Reward	39	1.59	0.080	37	1.43	0.083	36	1.44	0.084	40	1.35	0.076
Kagan-Avg. Rtn. Time	39	5.76	0.325	37	5.08	0.365	37	5.46	0.584	40	4.05	0.228
Kagan # Errors	39	33.51	2.778	37	38.97	3.089	37	42.40	2.611	40	50.75	2.815
Sears Sex Role	39	4.97	0.182	37	4.95	0.263	37	4.92	0.240	40	4.58	0.202
Curiosity Task Complex Viewing Time	39	116.31	16.213	37	116.90	19.834	37	115.43	13.756	40	78.83	9.650
Total Viewing Time	39	218.30	32.199	37	218.92	37.497	37	210.67	24.559	40	149.42	18.717
Complex/Total Viewing Time	39	.542	0.010	37	.541	0.010	37	.546	0.013	40	0.53	0.009
Lee-Clark Total	39	53.03	1.301	37	49.27	1.207	37	45.89	1.726	40	45.65	1.522
Sigel Sorting Task Descriptive-Analytic	39	5.97	0.670	37	4.95	0.664	37	8.11	0.925	40	6.15	0.732
Descriptive-Global	39	3.38	0.315	37	3.43	0.371	37	2.78	0.378	40	3.42	0.397
Relational	39	5.15	0.544	37	4.81	0.509	37	3.35	0.543	40	4.75	0.497
Categorical	39	3.97	.442	37	3.54	0.459	37	1.62	0.301	40	2.40	0.414

TABLE 1 - CONTINUED

	SOCIAL STATUS LEVEL											
	MIDDLE			UPPER-LOWER			LOWER-LOWER			ADC		
VARIABLE	N	MEAN	S. ERROR	N	MEAN	S. ERROR	N	MEAN	S. ERROR	N	MEAN	S. ERROR
Child:												
Sigel Sorting Task Nonscorable Verbal	39	1.03	0.368	37	2.97	0.645	37	3.03	0.555	40	0.20	0.602
Nonverbal	39	0.41	0.216	37	0.27	0.153	37	1.11	0.556	40	0.00	0.096
No Sort	39	0.08	0.077	37	0.03	0.027	37	0.00	0.000	40	0.00	0.000
Sum Scorables	39	18.49	0.586	37	16.73	0.709	37	15.86	0.805	40	16.72	0.604
Sum Shifts	39	12.85	0.536	37	13.08	0.432	37	10.76	0.748	40	12.48	0.465
Age (In Months)	39	73.87	0.551	37	74.22	0.543	37	74.14	0.562	40	75.08	0.529

TABLE 2
INTERCORRELATION MATRIX FOR MATERNAL FOLLOW-UP I DATA

VARIABLES	N	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Draw Circle Slowly	155		12	-06	-14	03	18	06	-08	07	00	05	-02	03
2. Kagan-Avg. Rtn Time	155			-24	-12	02	05	01	02	03	-10	29	16	25
3. Kagan # Errors	155				26	05	02	-27	07	-04	09	-48	-54	-53
4. Anxiety Score	155					27	-11	-22	19	-27	12	-38	-34	-38
5. Depression Score	155						-02	-11	07	-15	04	-12	-14	-13
6. Edwards-N-Ach.	152							0	-11	-19	-02	03	-10	-03
7. Edwards-N-Introception	150								-15	-10	-02	36	23	33
8. Edwards-N-Nurturance	150									-16	00	-17	-11	-16
9. Edwards-N-Change	148										-11	25	19	24
10. James-Locus of Control	56											-25	-18	-22
11. WAIS Verbal IQ	163												77	92
12. WAIS Performance IQ	155													88
13. WAIS Full Scale IQ	155													

TABLE 3
INTERCORRELATION MATRIX FOR CHILDREN'S FOLLOW-UP I DATA

VARIABLES	N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Draw Circle Slowly	153		-10	08	24	-28	-07	14	11	11	01	11	06	17	22	13	20
2. Gross Motor Control	153			05	04	05	03	11	12	-05	06	-11	09	-04	06	04	06
3. Delayed Reward	152				13	-08	01	02	02	-05	07	01	0	12	17	12	19
4. Kagan-Avg. Rtn. Time	153					-32	-01	19	19	01	0	04	09	14	17	15	26
5. Kagan # Errors	153						-10	-19	-18	-10	-04	06	-14	-10	-18	-11	-42
6. Sears Sex Role Pref.	153							-01	-01	-05	-13	02	16	-02	-02	11	02
Curiosity Task																	
7. Complex Viewing Time	153								93	06	-05	-01	04	-01	-04	04	05
8. Total Viewing Time	153									-07	-06	-03	04	-02	-07	02	02
9. Complex/Total Viewing Time	153										01	10	-03	0	04	06	15
Sigel Sorting Task																	
10. Descriptive Analytic	153											-17	-41	-43	36	-32	01
11. Descriptive Global	153												-18	01	17	34	-01
12. Relational	153													25	33	33	14
13. Categorical	153														21	30	40
14. Scorables	153															33	25
15. Shifts	153																12
16. Lee-Clark Total	153																

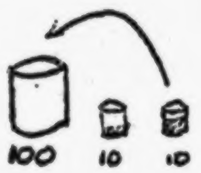
APPENDIX TO RESEARCH REPORT A - TASK DESCRIPTIONS

PRE-SCHOOL PROJECT, Summer 1967

____
code sex age date tester

Materials: 1 100 ml beaker, 2 10 ml beakers, 1 5 ml graduate, 2 10 ml graduates one of which has been cut down at the top, $\frac{1}{2}$ cup coke or liquid.

Seat child so that table top is at eye level.



1. (Two 10 ml beakers and one 100 ml beaker) Now I'm going to put some coke in these glasses. After a while we'll drink some. (Pour coke in both 10 ml glasses, with more in one). You don't need to show me, but can you see I put more coke in one glass than the other?

________ Yes

________ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you won't get any this time. You'll get another chance to drink some later. Now, before you pick, I take this one (10 with more coke) and pour the coke all out into this one (100 ml beaker). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

________ Picks correct 100 (ask Q's below)

________ Picks incorrect 10 (ask Q's below)

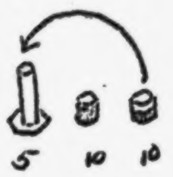
Did that one have more?

How could you tell?

(If says because empty was more:) But how can you tell now when it's like this (pointing to 100)?

(If says because it was more:) When was it more?

(Let child drink coke in glass he chose.)



2. (Two 10 ml beakers and one 5 ml graduate) Now let's fill these two glasses. Now I fill this glass (one of 10's) up to the very top. I don't fill this (other 10) glass up. Now, see, I put more coke in one glass than the other. You don't need to show me but can you see that one glass has more coke?

________ Yes

________ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you won't get any this time, but you'll get another chance to drink some later. Now, before you pick, I take this one (10 with lesser amount) and pour the coke all out into this one (graduate). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

______ Picks correct beaker(Ask Q's below; then let child drink and go to 2a)
______ Picks incorrect graduate (Ask Q's below; then move to Q 3 or 4)

Does that have more?

How could you tell?

Show me how you could be sure?

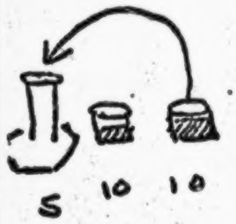
(If says because empty had less:) But how can you tell when it's like this (pointing to grad)?

(If says because it was more:) When was it more?

(If picked correct beaker, let child drink.)

(If incorrect on both Q 1 and 2, don't let child drink yet. Move to Q4.)

2a (If correct on Q 1 and correct on Q 2:)



(Two 10 ml beakers and one 5 ml graduate)
Now let's pour some more coke. Now I fill this glass (one of 10's filled to just below top of white dot). But I don't fill this (other 10) glass up. Now, see, I put more coke in one glass than the other. You don't need to show me, but can you see that one glass has more coke?

______ Yes

______ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you son't get any this time, but you'll get another chance to drink some later. Now before you pick, I take this one (10 with greater amount) and pour the coke all out into this one (graduate). Now look at them. If you can show me the one with more to drink, I'll give it to you.

______ Picks correct graduate (ask Q's below, then let child drink)

______ Picks incorrect beaker (ask Q's below, go to 2b)

Does that have more?

How could you tell?

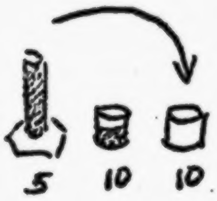
Show me how you could be sure?

2b. (If incorrect on 2a)
Which one had more before I poured it?

_____ Picks correct empty beaker

_____ Picks incorrect beaker with coke

Now, this one (point to graduate) has more coke in it. This one (point to beaker with less coke) has less. See (pouring graduate back into beaker), it's more. Then this (pointing to beaker with more) has more. Now, I pour it back (pour from beaker with more into graduate). Now look at them (pause). Now, you take the one with more coke to drink.

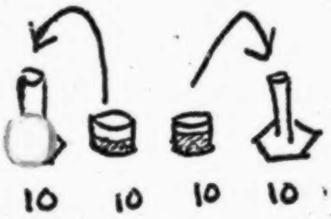


_____ Picks correct graduate (let child drink choice and terminate test)

_____ Picks incorrect beaker (ask Q's below)
Does it really get to be less when I put it in here (point to graduate)? How does that happen?

(Let child drink his choice and terminate test.)

3. (If picked correct 100 on Q 1 and incorrect graduate on Q 2:)



(Two 10 ml beakers and two 10 ml graduates, one of which has been cut to a shorter height) Now let's pour some more coke. (Pour coke into two 10 ml beakers, with more in one) Can you see that I put more coke in one glass?

_____ Yes

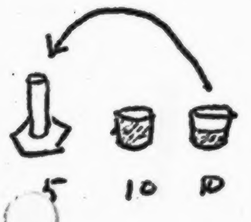
_____ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you won't get any to drink this time. You'll get another chance to drink some later. Now, before you pick, I take this one (10 with less) and pour it into this one (taller graduate), and I take this one (10 with more) and pour it into this one (shorter graduate). Now look at them. (Pause) If you can show me the one with more to drink, I'll give it to you to drink.

_____ Picks correct short graduate (ask Q below)

_____ Picks incorrect tall graduate (ask Q below)
Did you pick the one with more to drink?

(Let child drink)



a. (Two 10 ml beakers and 5 ml graduate)
Now let's fill these two glasses. Now I fill this glass (one of the 10's) up to the very top. I don't fill this (other 10) glass up. Now, see, I put more coke in one glass than the other. Can you see that one glass has more coke?

______ Yes

______ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you son't get any this time, but you'll get another chance to drink some later. Now, before you pick, I take this one (10 with lesser amount) and pour the coke all out into this one (graduate). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

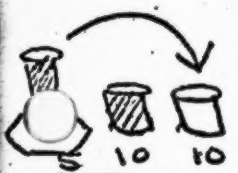
______ Picks correct beaker (Let child drink)

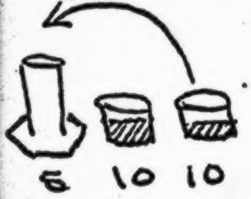
______ Picks incorrect graduate (go to Q4)

4. (If picked incorrect graduate:) Which one had more before I poured it?

______ Correct 10 with coke

______ Incorrect empty 10





See, this one (point to beaker) has more coke in it. This one (point to graduate) has less. See (pouring graduate back into beaker), it's less. Then this (pointing to beaker with more) has more. Now I pour it back (pour from beaker with less into graduate). Now look at them. (Pause). Now, you take the one with more coke to dring.

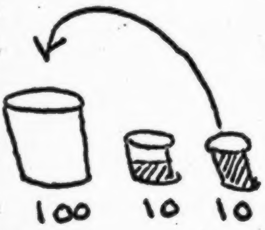
______ Picks correct beaker (Let child drink)

______ Picks incorrect graduate (Ask Q following)
Does it really get to be more to drink when I put it in here (point to graduate)?

How does that happen?

(Let child drink his choice.)

5. (If picked incorrect 10 ml beaker on Q 1:)



Two 10 ml beakers and one 100 ml beaker)
Now let's put some coke in these galsses. (Pour coke in both 10 ml beakers with more in one.) You don't need to show me, but can you see that I put more coke in one glass than the other?

______ Yes

______ No

When I say so, you can pick the bigger one to drink. If you don't pick the one with more to drink, you won't get any this time. Now, before you pick, I take this one (10 with more) and pour the coke all out into this one (100 ml beaker). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

______ Picks incorrect 10 (Go to Q 6)

______ Picks correct 100 (Ask Q's below)

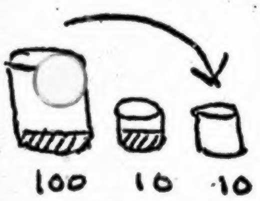
How could you tell?

(If say empty had more): But how could you tell when it's like this (point to 100)?

(Let child drink and terminate test)

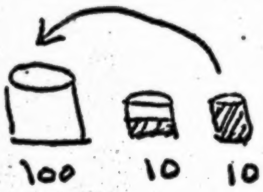
6. (If picked incorrect 10 or Q5:)

Which one had more before I poured it here (point to 100)?



______ Correct empty 10

______ Incorrect 10 with less



See, this one (point to 10 with less coke) has less to drink. See, (pouring coke from 100 ml beaker back into 10 ml beaker) this is more. Now, I pour it back (pour from 10 with more into 100). Now look at them. (Pause). Now, you take the one with more coke to drink.

______ Picks correct 100 (Let child drink).

______ Picks incorrect 10 (Ask Q's below)

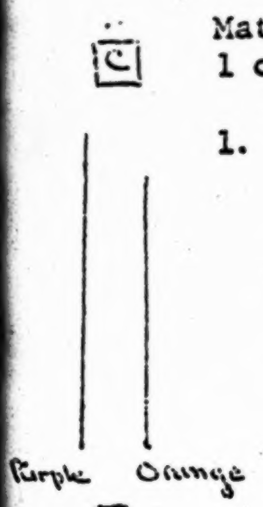
Does it really get to be less to drink when I put it in here?

How does that happen?

(Let child drink his choice.)

PRE-SCHOOL PROJECT, SUMMER 1967

Code Sex Age Date Tester

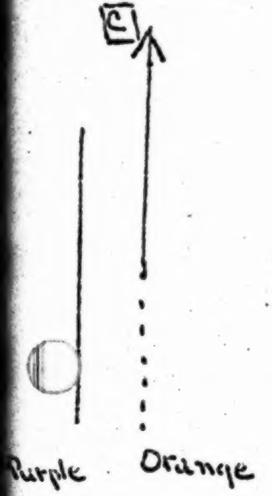


Materials: 4 pairs of 4" and 4¼" gum sticks. Three pairs are 2 colors, 1 pair is 1 color.

1. (One orange 4" and purple 4¼", placed parallel to child's line of sight, with ends farthest from child aligned)
Here are two sticks One is bigger and longer than the other You don't need to show me, but can you see that one is bigger and longer than the other?

Yes No

When I say so, you can pick the bigger and longer. One is to keep or chew If you don't pick the biggest one, you won't get gum this time. You'll get another chance to get gum later. Before you pick I put them like this (Place finger in center of orange stick and slide it toward child so that it extends about ½" beyond other stick)



Now, look at them If you can show me the biggest and longest one, I'll give it to you to chew after while

______picks longer purple (Let child take gum and then move to Q3)

______picks shorter orange (Ask the following and then move to Q2)

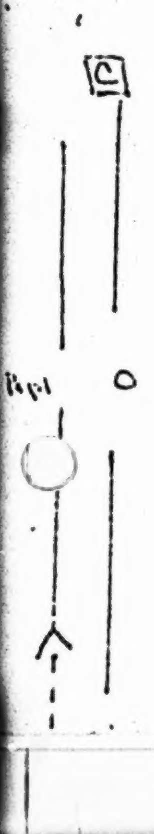
How could you tell it was bigger?

(If says "I looked at it," or I saw this was biggest," or similar ambiguous response which could refer to remembrance of which was bigger prior to advance, then ask following Q:)

When did you see it (look)?

(If says "I measured," or demonstrates by measuring, replace in advanced position and ask following Q:)

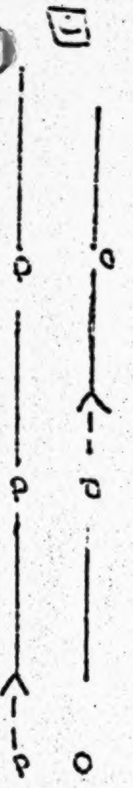
But how can you tell when its like this?



2. (Give this question only if child picked shorter orange on Q1)
(If sticks have been moved so that orange stick is not advanced toward child, replace them in this postion)
You told me this was the biggest one (point to orange)
(Place finger in center of purple stick and move it toward child so that it exte
about ½" beyond other stick)
Now show me the big one.

______picks longer purple (move to 2a)

______picks shorter orange (move to 2b)



a. (If chose longer purple in 2 above. Replace sticks in original position, with ends farthest from child aligned, and then move orange stick toward child so that it extends $\frac{1}{2}$'' past purple)

Before you said this (point to orange) was biggest.

(Move purple stick toward child so that it extends $\frac{1}{2}$'' past orange)

Now you say this (point to purple) is bigger. Do they really change bigness?

How is that (How does that happen)

(Move to Q5)

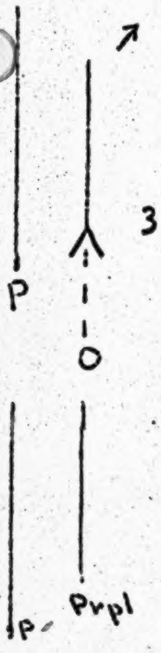
b. (If shorter orange was chosen in 2 above. Move orange stick toward child so that ends of stick farthest from child are aligned)

You said this was biggest (point to orange). Is it biggest now?

Do they really change bigness?

How is that (ie, how does that happen?)

(Move to Q5)

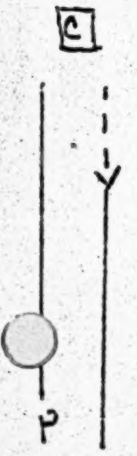


3. (Give this Q only if child picked longer purple on Q1)

(Take two other sticks of gum, one $4\frac{1}{4}$'' pink, one 4'' purple. Place them parallel to child's line of sight, with ends closest to child aligned)

Here are two more sticks of gum. One is bigger and longer than the other. You don't need to show me, but can you see that one is bigger and longer then the other?

Yes No



When I say so you can pick the bigger and longer one to keep or chew. If you don't pick the biggest one, you won't get gum this time. You'll get another chance to get gum later. Now before you pick, I put them like this.

(Place finger in center of purple stick and move it away from child so that it extends about $\frac{1}{2}$'' beyond the pink stick.)

Now look at them. If you can show me the biggest (and longest) one, I'll give it to you to chew after a while.

______picks longer pink stick (move to Q4c after asking the following Q)

______picks shorter purple stick (move to Q4 after asking the following Q)

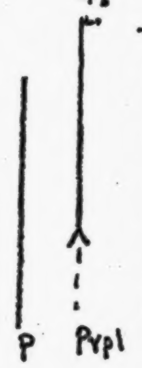
How could you tell it was Bigger?

(If says "I looked at it," "I new this was biggest," or similar amb

(If says "I looked at it," "I saw this was biggest," or similar ambiguous response which could refer to remembrance of which was bigger prior to advance, ask:)

When did you look (see it)?

4. (Start here only if picked shorter purple on Q3)
(If pieces have been moved so that purple stick is not advanced away from child, replace in this position)



You told me this (point to purple) was the biggest one. (Place finger in center of shorter purple stick and move it toward child so that it extends ½" beyond other stick)

Now show me the big one

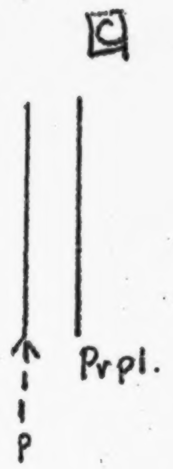
______picks longer pink

(Replace sticks in original position, with ends closest to child aligned, and then, while talking, move purple away from child) Before you said this (pt. to purple) was biggest. Now (move pink stick so it extends ½" beyond purple) you say this (pt. to purple) is bigger. Do they really change bigness?

How is that? (ie, how does that happen)

(Move to Q5)

_____picks shorter purple

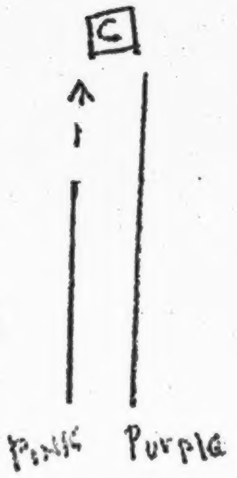


b. (Move pink stick toward child so that ends of sticks close to child are aligned)
You said this (pt. to purple) was biggest. Is it biggest now?

Do they really change bigness?

How is that?

Move to question 5



c. (Point to pink stick) This follows Q3 if said long pink was biggest.
You said this is biggest.
(Place finger in center of short purple stick and move it toward child so that the end nearest the child extends ½" beyond other stick)
Now show me the big one.

______Picks longer pink stick: (move to Q 5)

_____Picks shorter purple stick (move to 4D)

d. (Replace sticks in original position, with ends closest to child aligned.) Before (move purple away from child so it extends $\frac{1}{2}$'' beyond pink) you said this (point to pink) was biggest.
Now (move purple toward child so it extends $\frac{1}{2}$'' beyond pink at end closest to child) you say this (point to purple) is biggest. Do they really change bigness?

How is that? How does that happen?

Move to Q5

5. (One 4'' pink, one $4\frac{1}{4}$'' orange placed parallel to child's line of sight, with ends aligned in accordance with which way he is seeing illusion, i.e., if incorrect and picked orange on Q 1, align ends farthest from child; if incorrect on 3 and picked purple, align ends closest to child; if correct on 1 and 3, align ends closest to child if boy and farthest if girl)

Here are two candy sticks. See, one is bigger, one is longer? When I say so, you can pick the bigger one to keep or to eat. If you don't pick the biggest one, you won't get gum this time. You'll get another chance to get gum later. Now, before you pick, I put them like this. (Bend orange stick so that a straight line drawn from end to end would be about 3 3/4'' keeping alignment at one end with straight stick and not picking up from table.)

Now look at them. If you can show me the biggest one, I'll give it to you to eat after while.

______Picks correct orange

______Picks incorrect pink

Go to Q6, All Children.

C

6. (One 4'' , one $4\frac{1}{4}$'' of the same color, randomly arranged, non-parallel) Here are two gum sticks. Show me the bigger one.

______Picks longer stick

______Picks shorter stick

______Measures

Show me how you can tell which is bigger.

How can you make sure?

____
code   sex   age   date   tester

The following arrangement should be prepared before bringing the child into the room:

A. Two 14" pizza plates placed adjacent on a table. Plate to child's left has 6 M&M's of the same color equally spaced in a 12" line parallel to child's line of sight. Plate to child's right has 5 M&M's of the same color as the first, equally spaced in an 8" line parallel to the first line.

B. Two 14" pizza plates in another location, also adjacent to one another. Plate to child's left has 5 M&M's of the same color, equally spaced in a 8" line parallel to child's line of sight. Plate to child's right has 6 M&M's equally spaced in a 4' line, parallel to the first line.

1. (Lead child to first set of plates A)
Here's some candy. One plate has more than the other plate. When I say so, you may pick the plate with the most candy--the one that has more to eat--to keep or to eat. If you don't pick the one with the most candy, you won't get any candy this time. You'll get another chance later. Now if you can show me the one that has more candy, I'll give it to you to eat.

______ Chooses 5
Counts
______ Chooses 6

(If counts correctly or chooses correctly)
That's right. This one (point to plate with 6) has most. Now watch. I'm going to put them like this (rearrange 6 into shorter 4 1/2" line). Now look at them carefully. Now quickly show me the one that has more candy.

______ Chooses 5

______ Chooses 6

How did you know that was most?

(Let child take candy he chose.)

2. (Lead child to second set of platesB)
Now here's some more candy. One plate has more than the other plate. When I say so, you may pick the plate with the most candy--the one that has more to eat--to keep or to eat. If you don't pick the one with the most candy, you won't get any candy this time. You'll get another chance later. Now if you can show me the one that has more candy, I'll give it to you to eat.

______ Chooses 5
Counts
______ Chooses 6

Now how could you tell which had the most candy:

(If does not count:) If I thought this (child's non-choice) had more, how could you show me it doesn't?

(If still does not count:) Could you count them?

So which has more?

3. (If failed Q1 or Q2) (Spread out 6 into 12" line as counting them). See, there are 1, 2...5 here, and 1,2...6 here. This one (plate with 6) has most. Now watch. I'm going to put them like this (rearrange 6 into shorter 4 1/2" line.) Now look at them carefully. Now quickly show me the one that has more candy.

______ Chooses 5

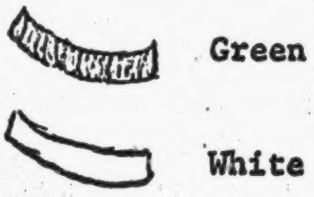
______ Chooses 6

How did you know that was most?

____
Code Sex Age Date Tester

Materials: 4 cookies in the shape of ring segments, one each white, green, red, blue, with white 1/8" shorter.

c



1. A Here are two cookies (large green closest to child, and small white on top). Look at them. Can you see one is bigger and has more to eat than the other? When I say so, you may pick the one with more to eat. If you don't pick the one with more to eat, you won't get a cooky this time. You'll get another chance later. Now before you pick, (place white on bottom closest to child) look at them. If you can show me the one with more to eat, I'll give it to you to eat.

________ chooses bigger top green: Ask B, then let child take cooky and move to Q3.

________ chooses smaller bottom white: Ask B, then move to Q2.

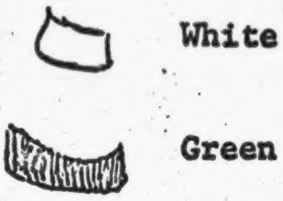
B 1) How could you tell that was more to eat?

2) Is one bigger? ______ if yes: Which is bigger? ___G ___W

How can you tell?

______ if no: What happened?

c



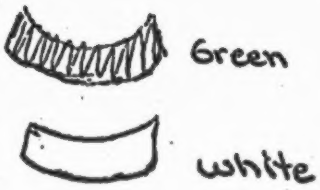
2. A (If chose smaller bottom white on Q1A) Now look, here's the one you picked. Now I put it here (place white on top away from child). Does it still have more to eat than the other one? Or does this one (point to green) have more to eat now?

________ chooses top white: Move to 2 C.

________ chooses bottom green: Move to 2B.

B 1) (If said bottom green had more to eat) How is that, how could you tell?

c



2) Which had more to eat when this (point to white) was here (point to space below green while pointing to white)?

_____ if white: Did it really change: Did it really get to be more to eat?

_____ if green: How is that? (move green back to top) Here is the way it was before. Does it have more to eat now?

(Let child take cooky and move to Q3)

C 1) (If said top white had more to eat, i.e. conserved choice)
How did you know this has more to eat?

2) Is one bigger? ______ if yes: Which is bigger? ___G___W

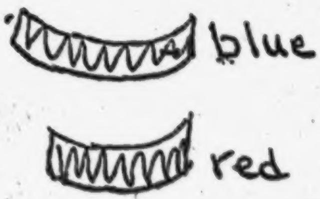
How can you tell?

if no: What happened?

(Let child take cooky and go to Q3)

3. A Here are two more cookies. (Two cookies of the same size, blue on bottom closest to child, red on top) You can pick the one with more to eat when I say so. Now this is harder. Look at them. Now before you pick I change their places. (Switch blue bottom to top) Now look at them. Which has more to eat?

C



_______ chooses equal blue top Ask B, then go to Q4

_______ chooses equal red bottom: Ask B, then ask C

B How did you know, how could you tell?

C (*Ask this only is chose red on 3A*) Which had more to eat when this (point to red) was here (point above blue while pointing to red also)?

_____ (says red had more:) Here's the way it was before (move blue below red closest to child). Does it have more to eat now?

______ if yes: (go to Q4)

_______ if no: Did it really get to be more to eat?

______ if yes: Did it get bigger? ___Yes ___ No
(Move to Q4)

______ if no: What happened? (move to Q4)

______ says blue had more: Did this (point to red) really get to be more to eat?

______ if yes: Did it get bigger? ___Yes [✓ No]

______ if no: What happened? (move to Q4)

4. Look, it looks like they change (Switch red back and forth several times, leaving it on top if red was last chosen as more, and on bottom if blue was last chosen as more). Which has more to eat?

   Is one bigger?

   What happens? Does it really change from big to small when I move it or what?

5. Show me how you can tell which is really the big one?

   (If no measuring) If I thought this (child's non-choice) is the bigger one, how could you show me it's not?

   (If no measuring yet) Can you measure them?

   (If still no measuring) Can you put them together to see which is bigger and has more to eat?

Measurement: Some systematic adjustment of the position of the two objects for comparision purposes. Note whether child does spontaﬁously - or in response to a particular question:

a. superimposes
b. realigns cookies in some way, or checks alighnment by putting finger at edges
c. spontaneously uses verbal concept of measuring
d. pushes together
e. compares end points of smaller one
f. uses hands to measure
g. notes apparent end discrepancy or clearly measures long one of bottom cooky with short one of top cooky.

PRE-SCHOOL PROJECT, SUMMER 1967 Generic Identity Picture form

____
code sex age date tester

Level

0 (1. Picture 1 only: If this cat really wants to be a dog, can it?

If no: why not?

If yes: would it be a real dog?

(2. Pictures 1 & 2: If this cat barks like a dog, what would he be? Would it be a cat or dog?

1 If dog: would it be a real dog then?

Why is that?

(3. Pictures 1& 3 only: If this cat had its whiskers cut off like a dog does, what would it be? Would it be a cat or dog?

If dog: would it be a real dog then?

Why is that?

(4. Pictures 1 & 4: What if this cat has his whiskers cut off, and barks like a dog? What would it be? Would it be a cat or dog?

2 If dog: would it be a real dog then?

Why is that?

(5. Pictures L & 5: This cat meows -- it doesn't bark -- but if it has its whiskers cut off and his head is like a dog, what would it be? Would it be a cat or dog?

If dog: would it be a real dog then?

Why is that?

3 (6. Pictures 1 & 5: What if this cat has its whiskers cut off, its (head like a dog, and barks like a dog -- what would it be? Would he be a cat or dog?

If dog: would it be a real dog then?

Why is that?

PRE-SCHOOL PROJECT, Summer 1967

____
code sex age date tester

Materials: 4 brown M&M's, 1 white mint

1. Look, here is some candy. Some are chocolate candy, (give child an extra chocolate M&M to eat). One is mint candy (give child extra mint to eat).

Are these chocolate candy?	Yes	No
Is this mint candy?	Yes	No

Now I'm going to have you pick some, and you must pick the most you can. If you don't pick what has more to eat, you won't get any candy this time. Now, pick either all the chocolate or all the candy. Which has more to eat?

Candy Chocolate

Why did you pick that?

Which are there more of, chocolate or candy?

Why is that?

2.	Put all the candy in my hand.	Correct	Incorrect
	Put all the chocolate in my hand.	Correct	Incorrect
3.	Is all the candy chocolate?	Correct No	Incorrect Yes
	Is all the candy mint?	Correct NO	Incorrect Yes
	Is some of the candy chocolate?	Correct Yes	Incorrect No
	Is some of the candy mint?	Correct Yes	Incorrect No

4. a. Now, listen carefully. If you took some of the chocolate away, would there be any chocolate left?

Yes No

b. If you took all of the chocolate away, would there be any chocolate left?

Yes No

c. If you took all the chocolate away, would there be any candy left?

Yes No

d. If you took all of the candy away, would there be any chocolate left?

Yes No

5. Then is there more candy or more chocolate?

Why do you say there is more ______________________?

6. What kind of candy is here?

7. 7. You take either all the candy or all the chocolate, whichever is more.

All Candy Chocolate Mint

____
Code Sex Age Date tester

Introduction:

"You know what a dream is, don't you? Do you dream sometimes during the might?"

"Can you have a dream if you stay awake and don't go to sleep?"

(If he says he does not dream, go on to 5)

(If he says he dreams, ask:)

"What did you dream about last time: tell me a dream you had."

"What happened after the dream was over? What did you think and do?"

3. a. "What happened to the (object) after you woke up? Where did it go; where was it after you woke up?"

(If it disappeared ask:) "Could you see it leaving?"

(If it hadn't disappeared ask:) "Could you see it when you woke up?"

"When you see a dog in a dream, is it the same as when you are awake at night and see a dog?"

2. a. What is this? (picture of a dog)____________________

Is this a real dog you see here, or is it a picture, just something that looks like a do

(If real:) Can this dog you see here bark or run?

3. c. Was the (object________) you saw in your dream just pretend, just something that looked like a (object), or was it a real (object)?

3. d. Was the (object) in your dream really there where you weeç really close to you, or did it just seem to be there?

(If really there:) Could you touch the (object) and (smell, or other appropriate sense) it?

5. The Origin of the Dream

"Tell me, where does a dream come from?"

"Where are dreams made, where do they come from?"

"Do they come from inside you or outside of you?"

"Who makes the dreams come out?"

"Is it you or is it somebody else?"

6. Location of the Dream

"While you are dreaming, where is your dream, where does it go?"

"Is it inside of you or in your room?"

(If the dream is in the head, in the thoughts, etc. (thus internal and not external) say:)

"If we could open your head while you are dreaming, if we could look into your head, could we see your dream?"

If not, why do you say that we could not see your dream?"

7. (If the dream is in the room on the wall, close to his eyes, under the bed, etc., say:)

"Is it only that the dream seems to be in your room or is it really in your room?"

If not really in room: "Where is the dream then?"

4. "If your mother is in your room while you are asleep and dreaming, can she also see your dream?"

Why not?

(If not): "How about me--could I see your dream if I were in your room while you were dreaming?"

8. Substance of the Dream

"What is a dream made of?"

"Is it made of paper?"

"Then, what is it made of?"

"Can we touch dreams?"

"Is a dream a thought or is it a thing?"

(If he says he didn't dream at beginning, return now to introduction and ask again to tell about a dream he had.)
10. (If the child still says he did not dream, ask him:)

"Let's make believe that you dream during the night about a monkey. Would it just seem that the monkey was there, or would the monkey really be there?"

"Let's make believe you dream about a monkey during the night. What would make you dream about thet, why would you have that dream?"

"Then do you know why we dream, why there are dreams?"

9. "When you had the dream about the (object), why did you have that dream? What made you have that dream?"

"Then do you know why we dream, why there are dreams?"

Scale Score

1. Know what a dream is.
2. Says picture of dog is not real
3. Dream object is not real
   a. partly aware of unreality of dream
   b. fully aware that dream is not real and consistent in saying this.
4. Dreams are not visible to others.
5. Dreams do not originate in the external physical world.
6. Thinks dreams may take place inside.
7. Sure dreams take place inside.
8. Dreams are not material things.
9. Dreams are caused in a purely subjective or immaterial fashion by the child himself.

PRE-SCHOOL PROJECT

FOLLOW-UP STUDY, SUMMER 1967

Child # ____________________
Time of Day ________________
Date ______________________
Examiner __________________

DELAYED REWARD PROTOCOL

We are finished now, and since you've been a good boy (girl), I would like to give you some candy. (Show one of each size.) Is one more to eat? Show me the big one with more to eat.

Correct Incorrect

I don't have enough of these big ones with me now so I can't give it to you now, but I do have a little one. You can either have this little one right now, or if you want, I will get a big one and give it to you when it's time for you to go home. Which would you like? Would you like this little one right now, or would you like to wait until time to go home and have the big one? (Repeat or reward as necessary to make sure the child is aware of the choice. Do not, however, try to talk him out of any choice he makes.)

_____ Picks small now

_____ Picks big later

Why did you pick that?

At time big candy is given to the child: Do you remember what I told you? What did I say?

If says wants big one now: I can't give you this one because it belongs to somebody else. I'll get one; just like it for you if you want to wait until it's time to go home. Now, you can either have this little one right now, or if you wait, I will get a big one and give it to you when it's time for you to go home.

PRE-SCHOOL PROJECT

FOLLOW-UP STUDY, SUMMER 1967

Child # ______________________
Examiner ______________________
Date ______________________
Time of day ______________________

IMPULSIVITY PROTOCOL

Have the child turn his chair around facing blank wall and say, "Now, I would like to see how long you can sit very quietly without moving at all. Just sit and don't move and don't talk. Let's see how long you can sit without moving or talking." (This should be said in a pleasant, quiet tone of voice.)

SCORING - use stopwatch

a) Record the second at which the child makes his first movement, and place the number "1" next to the description of that movement. Thereafter, serially number each movement. If none of the following descriptions fit, write in a description of the child's movement.;

Getting up ____

Walking ____

Turning around (body off chair) ______________________________

Head moving ____

Trunk moving ____

Leg and/or foot moving ______________________________

Arm and/or hand moving ______________________________

Talks (record response) ____

The first time the child either leaves his chair or talks; or after 180 seconds say, "That's very good. You can turn around now."

At end ask child A) "How long did you sit?"

B) "What did you think about while you sat?"

Briefly describe his behavior during the test.

DELAYED RECALL OF DESIGNS

"I am going to show you a design for a few seconds. Then I'm going to take it away and you will have to remember what it looked like. After a few more seconds, I will show you a whole group of designs that look something like the first one and you must point to the one that is exactly the same as the one that you first saw. Let's do some for practice."

(There are two practice items. If S makes two errors, E points out the correct answer. If after both practice items S does not understand the concept, then E will repeat the practice items.)

E shows the design for 5 seconds (and then turns the page and shows the blank for 15 seconds.) Then E turns to the page with the 12 stimuli. E times the subject's response time (to the half second) to the first response. E also codes the total number of errors for each item and the order in which they are made. If S is correct, E will praise. If S is incorrect, E says, "No, that is not the right one. Try again." (thus creating minimal anxiety). E continues to code S's responses (not times) until S gets the stimulus correct.

NOTE: On use of the stopwatch, timing is more accurate if E starts from 0 for each of the intervals (5 seconds, 15 seconds, time to first response). If E tries to turn pages at 5 seconds and again at 20 seconds by the watch, the time given to the child may not be accurate.

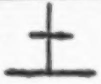
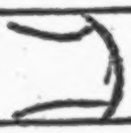
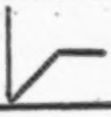
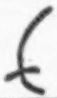
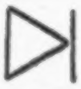
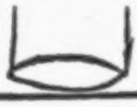
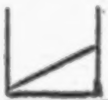
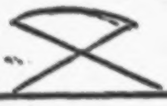
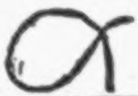
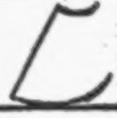
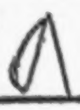
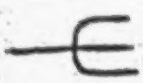
COGNITIVE STYLE PROJECT

DELAYED RECALL TEST

Name______________________________Sex____________Age_______School___________

Date____________________Session________________Examiner_____________________

RESPONSE LOCATION - TIME

Item	Figure												
1.		1	2	3	4	5	6X	7	8	9	10		
2.		1	2	3	4	5	6	7	8X	9	10		
3.		1	2	3	4X	5	6	7	8	9	10	11	12
4.		1	2X	3	4	5	6	7	8	9	10		
5.		1	2	3	4	5	6	7X	8	9	10		
6.		1X	2	3	4	5	6	7	8	9	10		
7.		1	2	3	4	5	6	7	8	9X	10	11	12
8.		1	2	3X	4	5	6	7	8	9	10		
9.		1	2	3	4	5	6	7	8	9	10	11	12X
10.		1	2	3	4	5X	6	7	8	9	10	11	12
11.		1	2	3	4	5	6	7	8	9	10	11X	12
12.		1	2	3	4	5	6	7	8	9	10X		

Kagan (revised: November 1961)

PRE-SCHOOL PROJECT

FOLLOW-UP STUDY, SUMMER 1967

INSTRUCTIONS FOR DRAW A CIRCLE SLOWLY

Materials: paper 8 1/2 x 11", primary pencil

Directions:

THIS IS A CIRCLE (E draws a standard 1 1/2" circle). I WANT YOU TO DRAW ONE FOR ME (let child draw a circle; make no reference to size; correct child only if shape is very wrong).

THIS TIME I'D LIKE YOU TO DRAW IT AS SLOWLY AS YOU CAN. (E demonstrates by drawing a line slowly). TAKE ALL THE TIME YOU WANT, AND SEE HOW SLOWLY YOU CAN DO IT.

(Record time taken to complete the circle. If child has not completed circle at end to ten minutes, terminate by saying, "That's fine. You can stop now.")

(If child stops in mid-circle, record time; say: "Keep drawing and don't stop until the circle is all done. Go as slowly as you can, but don't stop." Record time again until circle is completed, summing for total time.)

Note: Draw a Circle and Curiosity were done after the break so that the response times would not be affected by any undue restlessness.

THE COGNITIVE ENVIRONMENTS OF URBAN PRE-SCHOOL CHILDREN

Robert D. Hess, Principal Investigator

MANUAL OF INSTRUCTIONS
FOR ADMINISTERING AND SCORING
SIGEL CONCEPTUAL STYLE SORTING TASKS

The measures described in this manual were developed in the project, Cognitive Environments of Urban Pre-School Children, supported by: Research Grant //R-34 from the Children's Bureau, Social Security Administration, and the Early Education Research Center, National Laboratory in Early Education, Office of Education, both of the U.S. Department of Health, Education, and Welfare; the Division of Research, Project Head Start, U.S. Office of Economic Opportunity; the Ford Foundation Fund for the Advancement of Learning; and grants-in-aid from the Social Science Research Committee of the Division of Social Sciences, University of Chicago.

THE COGNITIVE ENVIRONMENTS OF URBAN PRE-SCHOOL CHILDREN

The research sample for the Cognitive Environment Study was composed of 163 pairs of Negro mothers and their four-year-old children, from three socioeconomic classes, defined by father's occupation and parents' education: upper-middle, professional and executive, with college education; upper-lower, skilled and blue collar, with high school education; lower-lower, semiskilled and unskilled, with no greater than tenth-grade education; a fourth group included father-absent families living on public assistance, otherwise identical to the lower-lower class group.

Subjects were interviewed in the home, and mothers and children were brought to the University of Chicago campus for testing, when the children were four years old. Follow-up data were obtained from both mother and child when the child was six years of age, and again at seven years.

Principal Investigator for the project is Professor Robert D. Hess, formerly Director, Urban Child Center, University of Chicago, now Lee Jacks Professor of Child Education, School of Education, Stanford University.

Co-Investigator for the follow-up study is Dr. Virginia C. Shipman, Research Associate (Associate Professor) and Lecturer, Committee on Human Development, and Director, Project Head Start Evaluation and Research Center, University of Chicago, who served as Project Director for the pre-school phase of the research.

Dr. Jere Edward Brophy, Research Associate (Assistant Professor), Committee on Human Development, University of Chicago, was Project Director for the follow-up study and participated as a member of the research staff of the pre-school study.

Dr. Roberta Meyer Bear, Research Associate (Assistant Professor), Committee on Human Development, University of Chicago, participated as a member of the research staff during the pre-school and follow-up phases of the project and was in charge of the manuscript preparation during the write-up phase of the research.

Other staff members who contributed greatly to the project include Dr. Ellis Olim (University of Massachusetts, Amherst), who was responsible for the major analysis of maternal language; Dr. David Jackson (Toronto, Ontario), who was involved in early stages of development of categories for the analysis of mother-child interaction, and participated in the processing and analysis of data; Mrs, Dorothy Runner, who supervised the training and work of the home interviewers, acted as a liason with public agencies, and had primary responsibility for obtaining the sample of subjects; and Mrs. Susan Beal, computer programmer.

COGNITIVE ENVIRONMENT STUDY

MANUAL FOR SIGEL CONCEPTUAL STYLE SORTING TASKS *

SUMMER 1967

MOTHER'S SIGEL CONCEPTUAL STYLE SORTING TASK

INTRODUCTION

During the first testing session at the University, mothers were administered the adult form of the Sigel Conceptual Style Sorting Task. Materials were black-and-white paper cutouts of human figures, from the Make-A-Picture-Story Test (MAPS).

ADMINISTRATION

The tester spread the figures randomly on a table, with no obvious groups placed next to one another (e.g., males, females, nudes, uniformed figures, shading, etc.). The subject was instructed:

> YOU SEE BEFORE YOU PICTURES OF PEOPLE. I WANT YOU TO PICK OUT AND PUT INTO ONE GROUP ALL THOSE FIGURES THAT ARE ALIKE OR THE SAME IN ANY WAY OR GO TOGETHER IN SOME WAY. YOU MAY HAVE AS MANY OR AS FEW FIGURES IN YOUR GROUP AS YOU WISH, BUT I JUST WANT YOU TO MAKE ONE GROUP. DO YOU UNDERSTAND? ALL RIGHT. GO AHEAD.

Reaction Time was recorded, beginning immediately after the tester said, "Go ahead." The score was the number of seconds until the subject picked up the first figure.

After the subject had completed a sort, the tester recorded the figures selected and asked:

> WHAT IS THE REASON YOU PUT ALL THESE TOGETHER?

The subject's response was recorded *verbatim*.

---

* This manual is based on the conceptual style sorting task procedures and coding categories developed by Dr. Irving E. Sigel, Director of Research, The Merrill-Palmer Institute, Detroit, Michigan.

The tester than replaced the figures randomly on the table, and said:

ALL RIGHT. NOW I WOULD LIKE YOU TO MAKE ANOTHER GROUPING, TAKING THOSE FIGURES THAT ARE ALIKE OR THE SAME OR GO TOGETHER IN ANY WAY, BUT THIS TIME ON THE BASIS OF A DIFFERENT REASON THAN YOU USED BEFORE. DO YOU UNDERSTAND? ALL RIGHT. GO AHEAD.

Once the sort was made, the subject was asked for a reason. Again, reaction time, the figures selected, and the verbatim response were recorded.

This procedure was repeated until the subject made 12 groupings or sorts. After two or three sorts, instructions were reduced to:

ALL RIGHT. I WOULD LIKE TO MAKE ANOTHER GROUPING BUT AGAIN ON THE BASIS OF A DIFFERENT REASON.

CHILD'S SIGEL CONCEPTUAL STYLE SORTING TASK

INTRODUCTION

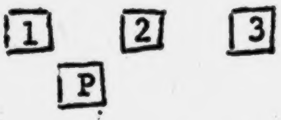
During the second testing session at the University, the four-year-old children were administered the children's form of the Sigel Conceptual Style Sorting Task. Materials included fifteen sets of black-and-white photographs of common objects, animals, and humans, and five sets of black-and-white cut-out paper figures from the Make-A-Picture-Story Test (MAPS). Each set was composed of a presentation picture and three choice pictures:

	Pictures		
Presentation	1	2	3
1. tomato	banana	orange	pear
2. duck	fish	camel	hen
3. chair	dresser	table	rocking chair
4. MAPS #6	MAPS #11	MAPS #9	MAPS #101
5. stagecoach	sailboat	airplane	jeep
6. smiling cowboy	smiling man	neutral policeman	ranch
7. banana	green beans	grapes	celery
8. MAPS #71	MAPS #72	MAPS #3	MAPS #108
9. cow	elephant	horse	sheep
10. bed	cradle	chest	lamp
11. baby	playpen	girl	man
12. bread	tomato	apple	ham slice

13. MAPS #68	MAPS #32	MAPS #31	MAPS #18
14. Truck	dog	horse	sheep
15. ranch	stagecoach	horse	cowboy
16. MAPS #107	MAPS #118	MAPS #5	MAPS #67
17. tractor	engine	rocket ship	boat
18. fireman	fire station	soldier	policeman
19. smiling nurse	neutral nurse	smiling stewardess	sad stewardess
20. MAPS #109	MAPS #112	MAPS #104	MAPS #105

ADMINISTRATION

The presentation picture was placed on a table in front of the child, with three choice pictures immediately above it, aligned horizontally to the child's right (to his left if left-handed):



As the tester pointed to each of the four pictures, the child was asked to name it. His response was recorded, whether correct or not. A wrong label was not corrected, nor was the child given the name if he did not know it.

The tester instructed the child:

TAKE ONE OF THESE (pointing to three choice pictures) THAT BELONGS WITH THIS OR LOOKS LIKE IT (pointing to presentation picture) AND PUT IT WITH THIS ONE (presentation picture; i.e., the child was told to place his choice next to the presentation picture, under #3 in the figure above).

Acceptable alternative wordings of the instructions include:

TAKE (PICK OUT) THE ONE (OF THESE) THAT GOES WITH THIS (ONE), etc.

or

TAKE ONE OF THESE AND PUT IT WITH THIS (THAT) ONE.

②

the selection was recorded, and the child was asked as the tester indicated the presentation picture and the one the child had selected:

WHY DO THESE GO (BELONG) TOGETHER?

or

WHY DID YOU PICK THIS ONE?

If the child gave no reason, but repeated the labels, or pointed to the pictures, the tester said:

TELL ME ABOUT THESE.

If the child said "because they're the same," the tester asked:

IN WHAT WAY ARE THEY THE SAME?

The tester continued to encourage the child to tell her the basis of his sort, how the figures were the same, why they went together, until the child gave a scorable verbal response, or persisted in a nonscorable or nonverbal response.

"How are they alike?" was not asked, since young children, especially lower-class children, are not as familiar with the word "alike" as they are with "the same" or "goes with".

COGNITIVE ENVIRONMENT STUDY

SCORING MANUAL FOR SIGEL CONCEPTUAL STYLE SORTING TASKS

INTRODUCTION

All subjects in the Cognitive Environment Study -- mothers and their four-year-old children -- were administered Sigel Conceptual Style Sorting Tasks during testing sessions at the University. Although the material and instructions differ for the adult and child versions of the task, the formal scoring categories are the same. In each task, the subject is asked to make a "conceptual sort": the child is asked to select one of three items to go with a presentation picture; the mother, to group together two or more figures from a large array. And in each task the subject is asked to explain his sort, to tell why the items go together. The formal coding categories described in this manual apply to that verbal response and refer to the subject's conceptualization of the similarities and relationships among the items constituting a sort. Possible bases for sorts include descriptive or stimulus-centered concepts, relational or functional concepts, and categorical or inferred-class concepts. The subject may offer a verbal response which cannot be scored, such as a disjunctive statement or a vague reference. He may be unable to verbalize the concept, in which case he is credited for having made a sort but receives a score for nonverbal conceptualization; or the subject may be unable to make a sort, in which case he receives a score for a non-sort.

FORMAL SCORING CATEGORIES

I. Descriptive: (Stimulus Centered) Concepts which are derived directly from the physical attributes of the stimulus and ones in which the conceptual label contains a direct reference to a physical attribute present in the stimulus. Descriptive responses are of two types: Analytic (Part-whole) and Global.

Descriptive-Analytic or Part-whole:

D-1: Sorts in which the physical attributes or properties of the materials presented are the basis of similarity; e.g., color (black and white only), texture, shading, shape, or size.

D-2: Sorts in which the description of physical attributes of the objects or figures depicted are employed: e.g., heads, legs, wheels, guns, holding objects in their hands, clothing (uniforms, well-dressed, casually dressed, professional dress), baldness, hair color, static posture (prone position, sitting position), nudity (lack of clothing, they are nude but not "These are nudes." Latter considered class of nudes and scored for D-3), crippled or physical disability (physical injury, physical handicap), etc. (smiling, frowning, straight mouths on human figures other than MAPS also included).

Descriptive-Global:

D-3: Sorts in which the label designates the status, occupation, etc. where the cues are manifest in the stimulus; e.g., policeman, soldiers or army men, nurses, nudes, boats, trucks, etc.

D-4: Sorts in which discrete age categories are employed; e.g., children, old people, adults, babies, young people, etc.

D-5: Sorts in which one of the sexes is grouped; e.g., males, females.

D-6: Sorts based on age and sex; e.g., old men, young women, boys, girls, etc.

Descriptive-Analytic or Part-whole (objects only):

D-7: Sorts based on or dealing specifically with the physical attributes or structural material; e.g., wood, plastic, steel, etc. (Does not apply to MAPS figures.)

II. Relational-Contextual: Concepts which are used to tie together (or relate) two or more people or objects. In this category no stimulus is an independent instance of the concept; any one stimulus gets its meaning from a relationship with the other stimuli; e.g., a mental hospital scene, a family scene, the horse pulls the stagecoach. The relationship must be between the stimuli in the subject's sort and not between the stimuli and any external factor brought in by the subject. For example, "These people all belong in a mental hospital" is not scored as relational since there is no hospital present and no interaction among the stimuli in the sort--each stimulus is independent of every other stimulus. However, "This is a mental hospital scene. These are the patients and this is the doctor who is treating them," is scored as relational since no stimulus is an independent instance of concept, "mental hospital scene."

R-1: Thematic: Sorts which are based on themes, plots, or stories where no category is used; e.g., he killed this man, she is giving him food, the boy is helping the blind man to cross the street, etc.

R-2: Geographical: Sorts in which the instances are related in space--locale, geographic, domiciliary, etc.--where the spatial reference is not an external factor but is one of the stimuli in the sort; e.g., the wac and the soldier belong on the army base, these tools belong in the trunk of the car, these animals belong on the ranch.

R-3: Temporal: Sorts in which the figures are grouped on the basis of the temporal development of the individual; e.g., this is a person growing up, these are the stages of man; or temporal sequence; e.g., before and after of a crime.

R-4: Comparative: Sorts based on comparison between two or more stimuli; e.g., better than this one, different from this one, one is dressed casually and the other formally.

R-5: Functional: Sorts in which objects are grouped together on the basis of their interdependent use or function, behavior or activity; e.g., the steam shovel digs sand to put on the truck, sit on a chair to eat at the table, ham and bread are used to make a sandwich, the horse pulls the stagecoach, all these objects make up a home.

R-6: Sorts in which figures are grouped on the basis of an understood relationship state between them.

A. Kinship: a family group, husband and wife, mother and child, brother and sister, etc.

B. Other Relationship States: Doctor-nurse, teacher-student life drawing class, etc.

R-7: Conditional: Sorts in which the stimuli are related conditionally; e.g., if this, then that.

Note: All sub-categories grouped together
Score for "R" in general only.

III. Categorical-Inferential: A group of figures or objects are put together where each stimulus in the sort is representative of the total class. These sorts are based on inferred or non-observable characteristics of the stimuli, each instance is not interdependent, and a class label is used--it is an inference. (Note: It must be kept in mind that the categorical response is not necessarily a conceptual one in the Goldstein or Werner sense. What we are dealing with in the following instance, "People ride in these." is a categorical response tied to a concrete reality in contrast to "These are vehicles," which would be a more objectifying and abstracting statement.)

MAPS SORTS (human figures only)

C-1: Sorts in which the figures are grouped on the basis of a common behavior, role, or participiples of action: e.g., these people all work for a living, these people all do services, these people do something worthwhile or constructive, these people are walking, modeling, sleeping. Also motivational states; they are intent on committing a crime.

C-2: Sorts in which the objects are grouped on the basis of status, class or attributes; e.g., professional people, criminals, handicapped people, dignified people, solemn people, intelligent looking, sick people, invalids, crippled, disabled, incapacitated, handicapped, people who need help, dead people, Negroes, Orientals, Caucasians, military people, these people represent justice or [illegible] tolerance or crime or physical health, these people have a persuasive expression or ordinary expression, suffering people, artistic people, medical people, clergymen.

C-3: Sorts in which the basis of similarity is a moral or aesthetic value or judgment.

A. Aesthetic: pretty, ugly, beautiful, attractive, etc.

B. Moral: good, bad, wicked, evil, "shady" looking character, malicious intentions, etc. (realm of right and wrong.)

C-4: Sorts in which figures are grouped on basis of a common affect or emotion: state; e.g., sad, unhappy, suffering, aggression, hostility, anguish, sorrow, suffering people, crying, violence, etc.

C-5: Sorts in which stimuli are grouped on basis of spatial reference--common locale, geographic, domiciliary, etc.; e.g., These people would all be found in a hospital, these people would all be in the street, or in a mental institution.

C-6: Sorts in which the basis of similarity is a sexual reference other than designation of sex of figures; e.g., these are the sexy ones, sensuousness, girls who think they know about life, look seductive.

HUMAN AND OBJECT SORTS

C-1: Function, Use, or Behavior: (Includes all examples of C-1 for MAPS plus function and use for objects.) Examples are: things to build with, these carry people and freight, they swim in water, used for cutting, we eat these, these are rocking things, used to turn bolts, these are used by people.

C-2: Class-naming: e.g., professional people, homemakers, military men, human beings, furniture, farm animals, land vehicles, ways of transportation, foods.

C-3: Attributes: (Static traits of stimuli are basis of similarity--non-functional, non-action, non-affective states.) Examples: juiciness, tough skins, wildness, these grow on vines, these run by motors, these move on wheel, these are sharp, these are self-propelling, these are manufactured, these are inanimate, these can be eaten without cooking, these people are handicapped, these people can't walk, they are dependent.

C-4: Affect or Emotional State: (Does not apply to object sorts.) This category is the same as C-4 on MAPS with one exception: The terms--smiling, frowning--are scored as D-2 on human figures but as affect on MAPS figures.

C-5: Geographical: (Same as MAPS) These people are found in the home, they belong in the jungle, see them in the zoo, grown on a farm, they go in the water, live on a farm. Note: The spatial reference is not one of the stimuli but is the only basis for the grouping. If there is another basis along with the spatial reference, score for the former; e.g., "These swim in water" or "These are used on a farm" are scored as C-1.

C-6: Value judgment, moral judgment, or aesthetic judgment: (Same as C-3 on MAPS) For human figures would include: normal faces or normal expressions, look regular, look surprised, serious look on their faces (where specific affect or emotional state cannot be ascertained). Also, these (referring to foods) are good for you, these make you healthy, these (tools) are important for man. Egocentric responses, if they are the only basis for the sort, are included: e.g., I like these.

OBJECT SORTS (objects only)

C-7: Presumed constituent parts or attributes: Basis of similarity is unseen (non-manifest) parts or inferred attributes of stimuli: e.g., seeds, motors, colors other than black and white (the tomato and apple are red), these are solid, etc.

NONSCORABLE RESPONSES

Nonscorable:
Verbal: broad or vague statements: "looks like it", "the same", "just alike"; or disjunctive responses: "this is a truck and this is a horse".

Nonverbal: Subject makes a sort but does not verbalize a rationale; points, puts cards or figures edge-to-edge, on top of each other or otherwise together, or says "Don't know".

Nonsort: Subject is unable or refuses to make a sort.

CHILDREN'S COGNITIVE SORTING TASK
SCORE SHEET

Code__________

P	1	2	3	Child's Verbal Response
1. tomato	banana	orange	pear	
2. duck	fish	camel	hen	
3. chair	dresser	table	rocking chair	
4. P-6	11	9	101	
5. stage-coach	sail-boat	airplane	jeep	
6. sm. cowboy	sm. man	n. police	ranch	
7. banana	green beans	grapes	celery	
8. 71	72	3	108	
9. cow	elephant	horse	sheep	
10. bed	cradle	chest	lamp	
11. n. baby	playpen	n. girl	n. man	
12. bread	tomato	apple	ham	
13. 68	32	31	18	
14. truck	dog	horse	sheep	
15. ranch	stage-coach	horse	cowboy	
16. 107	118	5	67	
17. trac-tor	engine	rocket ship	boat	

CHILDREN'S COGNITIVE SORTING TASK
SCORE SHEET --cont.

Code__________

P	1	2	3	Child's Verbal Response
18. n. fireman	fire station	n. soldier	n. police	
19. sm. nurse	n. nurse	sm. steward	sa steward	
20. 109	112	104	105	

COGNITIVE ENVIRONMENT STUDY

MANUAL FOR ADMINISTERING AND SCORING THE CURIOSITY TASK

SUMMER 1967

INTRODUCTION

The four-year-old children in the Cognitive Environment Study sample were administered an experimental measure of curiosity at the second testing session. The stimuli were eight pairs of simple and complex drawings, adapted from those used by Berlyne, Smock and Holt, and the Cantors. The viewing apparatus or "curiosity picture-box" was similar to that used in the Cantors' studies.

PROCEDURE

Sixteen test pictures, preceded by two trial cards, were presented to the child one at a time in a large viewing box: each card was inserted inside the box at the rear, and the child was told to look through a viewing slot at the front of the box. The pressure of the child's head on a bar immediately above the viewing slot operated a light so that the interior of the box was illuminated and the picture could be seen only when the child was leaning his forehead against the bar, looking into the viewing slot. The same mechanism activated a clock. When the child sat back in his chair, moving his head away from the viewing slot, the light went off and the clock stopped. Viewing time was registered on the clock to .01 seconds.

STIMULI

Each of the eight pairs of drawings of common geometric figures, elements, and animals, is composed of a simple and a complex member, defined by the number of objectively observable elements or relationships represented. Each pair is characterized by one of four types of stimulus complexity, as indicated in the illustration. The order of presentation of the 16 cards was counterbalanced for type of complexity and for comlex vs. simple.

ADMINISTRATION

The subject was seated in a child-sized chair, facing the picture-box which was placed on a low table. The examiner sat to the child's right, and perpendicular to the child's line of vision.

The instructions given to the child by the examiner were aimed at accomplishing, in steps, the following:

1. the child understands how to make the light go on;
2. the child understands how to make the light go off and how to keep it on for some time;
3. the child explores the empty box to satiate any motivation toward that object;
4. the child demonstrates, in two trial items, his ability to turn on the light, focus his attention on the drawing inside the box, and turn the light off when he no longer wants to see that item.

The specific instructions given to the child, with auxiliary instructions for children who do not catch on immediately or whose behavior might disrupt the task or distort the performance measures, are listed below in these four steps.

1. NOW WE'RE GOING TO LOOK AT SOME PICTURES. THIS IS A PICTURE-BOX. IT DOESN'T HAVE ANY PICTURES IN IT NOW, BUT I'LL PUT SOME IN FOR YOU TO LOOK AT. NOW, YOU LOOK IN HERE (indicate viewing-slot).

   a. If S doesn't look or looks without pressing forehead against bar: LOOK HARDER. HARDER THAN THAT. LOOK REAL HARD. (etc., until S's head has triggered light).

   b. If S still hasn't caught on, press his head against the bar until light clicks on.

   c. When S turns light on with head: WHAT HAPPENED? WHAT DID YOU DO? YOU MADE A LIGHT GO ON, DIDN'T YOU?

   d. If S still hasn't turned light on, demonstrate: WATCH ME. SEE, I PUT MY EYES RIGHT HERE SO I CAN SEE INTO THE BOX. NOW WATCH (get S' face next to E's) -- SEE, I CAN MAKE THE LIGHT GO ON. NOW YOU DO IT: PUT YOUR HEAD HERE AND MAKE THE LIGHT GO ON.

2. YOU CAN TURN THE LIGHT ON WITH YOUR HEAD, CAN'T YOU? CAN YOU MAKE IT GO OFF? AND ON AGAIN? CAN YOU MAKE IT STAY ON?

   a. If S uses hands: YOU CAN TURN IT ON WITH YOUR HANDS, CAN'T YOU? BUT I WANT YOU TO DO IT WITH YOUR HEAD. PUT YOUR HANDS ON THE TABLE/IN YOUR LAP, AND MAKE THE LIGHT GO ON WITH YOUR HEAD.

   b. If S "plays" with light, clicking it on and off: JUST MAKE IT GO ON AND STAY ON: CAN YOU DO THAT?

3. When S has mastered the light switch: NOW YOU CAN SEE WHAT'S IN THE BOX. YOU CAN LOOK AS LONG AS YOU WANT. IS THERE ANYTHING IN THERE? (Chat with S until he has explored the empty box and seems to be ready for the pictures. Light should be off and clock reset to 0.)

4. NOW I'M GOING TO PUT A PICTURE IN FOR YOU TO LOOK AT. DON'T LOOK UNTIL I SAY READY/OK. WHEN I GET THE PICTURE READY, I'LL SAY READY/OK, AND YOU CAN TURN ON THE LIGHT AND LOOK AS LONG AS YOU WANT. WHEN YOU'RE TIRED OF LOOKING AT THE PICTURE, JUST SIT BACK AND I'LL GIVE YOU ANOTHER ONE.

   a. Insert trial card A: READY/OK.
   When S is through looking and light is off, ARE YOU THROUGH LOOKING AT THAT PICTURE? DO YOU WANT TO LOOK AT IT SOME MORE, OR SHALL I PUT ANOTHER PICTURE IN?

   b. If S says he's through (If S looks again, when he's finished second viewing): remove card; record time; reset clock; OK, NOW I'M GOING TO PUT IN ANOTHER PICTURE (AND THIS TIME LOOK JUST ONCE, FOR AS LONG AS YOU LIKE). WHEN YOU'RE THROUGH LOOKING AT THIS ONE, SIT BACK, AND I'LL GIVE YOU THE NEXT PICTURE.

c. Insert trial card B: READY/OK.
When S is through looking, remove card, record time, reset clock. NOW YOU CAN LOOK AT THIS PICTURE AS LONG AS YOU LIKE. JUST SIT BACK WHEN YOU'RE THROUGH WITH IT.

d. Insert card 1. Repeat c., above, if necessary, for any of the cards. Always say, "READY" or "OK" when a card has been inserted, to get S used to not looking before the card is in place.

SCORING

Two types of scores were obtained from the recorded total viewing time for each picture: total viewing scores, and proportion scores indicating relative preference for complex or simple items.

- Total Viewing Time: the total number of seconds (to .01 seconds) for all sixteen cards; subscores for Total Viewing Time include the Total Complex Time or total number of seconds viewing the eight complex items; and Total Simple Time or the total time viewing the eight simple items.

Curiosity Proportion scores included, for each pair, the ratio of time viewing the complex member to the total time spent on both members of the pair (complex / complex + simple); for each type of stimulus complexity, a mean proportion score was obtained by summing the proportion scores for the two pairs representing that type of complexity, and dividing by two (e.g., pair 2 proportion + pair 6 proportion, divided by two, gives the average proportion score for Incongruity). Finally, and overall curiosity ratio score was obtained by dividing the Total Complex Time by Total Viewing Time. This score is again complex / complex + simple, a summary statement across all 8 pairs without, however, giving equal weight to each pair: it is not the average of the 8 proportion scores.

SEARS SEX PREFERENCE SCORE SHEET

Score (0 to 8) ______________________ Name ______________________

I'll show you two pictures and you get to pick one of them. Here's one. Which do you like best?

(Practice	M		F	score
	1 (blocks)	x	5 (workbench)	
	1 (blocks)	x	3 (tea)	
	6 (car)	x	4 (dress)	
	2 (cowboy)	x	7 (cook)	
	6 (car)	x	8 (wash)	
	5 (bench)	x	8 (wash)	
	1 (blocks)	x	7 (cook)	
	2 (cowboy)	x	4 (dress)	
	5 (bench)	x	3 (tea)	
(practice)	2 (cowboy)	x	6 (car)	

COGNITIVE ENVIRONMENT STUDY

Mother's Code____________

Listed below are five objects. Your task is to write down as many different uses as you can for each object. Several examples are given in each case. You will have approximately 15 minutes. Be sure to write down some uses for each object. Write down anything that comes to mind, no matter how strange it may seem.

1. BRICKS Build houses, doorstop,

2. PENCILS Write, bookmark,

3. PAPER CLIPS Clip paper together, make a necklace,

4. TOOTH PICKS Clean teeth, test cake,

5. SHEET OF PAPER Write on, make an airplane

DOLL PLAY

Show child the dolls, labeling them as they are shown.

THIS IS THE TEACHER, THIS IS THE FATHER, THIS IS THE MOTHER, AND THESE ARE THE CHILDREN AND THEY ARE ALL IN THE SECOND GRADE.

Place dolls in front of E so that they face the S.
Note any comments or reactions of S to the dolls on the recording sheet.

Speak slowly - be sure you have the child's attention.

I'D LIKE YOU TO MAKE UP A STORY ABOUT SCHOOL. YOU CAN USE SOME OR ALL THE DOLLS TO HELP YOU TELL THE STORY IF YOU WANT TO. BUT I WANT YOU TO TELL ME SOMETHING THAT MIGHT BE HAPPENING IN SCHOOL.

If S asks if he can or has to use all the dolls tell him it's up to him, that he can use as many as he wants to.--WHAT I WANT YOU TO DO IS TO MAKE UP A STORY ABOUT SOMETHING HAPPENING IN SCHOOL.

Probes
"WHAT'S GOING ON" "TELL ME MORE ABOUT IT" "THEN WHAT HAPPENS"

After first spontaneous verbalization wait--if child doesn't go on ask him to tell you more about it--then ask about feelings, endings, etc.

After story ask "why" questions, to find out about unexplained emotional reactions, etc.

Try to get an ending to the story.

Recording:

Record verbatim what the child says, describe all actions to dolls, especially when S is not verbalizing.

B. Maternal Antecedents of Intellectual Achievement Behaviors in Lower Class Preschool Children

Principal Investigators: Robert D. Hess and Virginia C. Shipman
Project Director: Diana T. Slaughter

The principal aim of this research was to determine part of the process by which young lower class Negro children's actual achievements in the middle class school setting are influenced by behaviors and attitudes of their mothers. An implicit assumption of this research was that maternal and child behaviors within a relatively homogeneous group such as the lower class Negro ghetto community could be differentiated, and that these behaviors would have psychological significance.

1. Problem

The volume of research literature directed at prediction of children's achievements from parental variables is small. Possibly, the most important reason is the relative absence of theories of either parent or child behaviors which could be adapted to study of the socialization of young children's achievements (Sigel, 1956; Crandall, 1963). In this study, the concept maternal individuation was introduced as an important predictor of the level of these preschool children's achievements.

A related problem has been the interpretation of the results of children's intelligence tests. Earlier models for the study of children's achievement behaviors distinguished between a child's innate ability, as measured by standard intelligence tests, and his actual school achievements, as measured by standard achievement tests or achievement ratings. From such models came the concept of the "under" or "over achiever. Parents were viewed primarily as positive or negative influences upon the motivational determinants of children's actual achievements. Recent studies have indicated, however, that situational and environmental factors contribute significantly to the results of intelligence tests (Davis, 1948; Eells, 1951; Hunt, 1961; Deutsch, 1963; Bloom, Davis, and Hess, 1965). It has been generally concluded that, particularly with regard to young minority group children, the results of intelligence tests might best be viewed as cumulative achievements to date, rather than approximations of innate ability. Furthermore, there is some indication that parental variables will contribute to the cognitive or intellectual aspects of these children's achievements behaviors, as well as to their motivational determinants.

Parental variables which have been identified in this regard include: a high level of verbal interaction between adult and child (Milner, 1951); maternal acceleration, in terms of the mother's specific early concern with, and encouragement of, her child's intellectual development (Moss and Kagan, 1958); low maternal nurturance with regard to girls, but not boys (Crandall, 1967), more permissiveness with regard to limits (Cross, 1965; Busse, 1967) and early sexual curiosity (Rau, 1964) and, generally speaking, greater verbal stimulation and specific informational input during infancy and childhood in the home between mother and child, and more registered investment in higher achievement by the child in problem solving tasks (Dave, 1963; Bing, 1964; Stodolsky, 1965; Olim, 1965; Brophy, 1967).

Bear, Hess, and Shipman (1966) found that the Negro mother's sense of potency with regard to her ability to influence the school and also the tendency to use informative or instructive statements with regard to the child's potential preparation for the first day of school were positively associated with higher Binet I.Q. scores and overall confidence in the testing situation. This same tendency to utilize instructive statements has been found to be associated with these children's learning in a structured mother-child interaction situation (Hess and Shipman, 1965). As partial explanation of these and similar findings, Hess and Shipman have argued that the constriction of the experimental alternatives within the macroscopic lower class Negro ghetto community is reflected also in the microscopic mother-child unit. Such a mother being unaccustomed to consideration of alternatives in problem-solving, does not teach this approach to her child, an approach typically essential to success in the middle class school system.

With the exception of the work of Hess and Shipman, however, there are still relatively few achievement studies which relate the variables and measures of the psychological home environment to the experimental background of the population sampled. Emphasis in the present study is derived from the approach of Hess and Shipman. Maternal behaviors which could stimulate productive problem solving were first identified and then it was predicted that these would be associated with the level of these children's achievements. It was also argued that the subcultural experiences of mothers and children within the Negro ghetto are such that it is particularly appropriate to focus on the problem of which maternal behaviors would be more intellectually stimulating within this group.

Some of these experiences have been identified by several authors (Moynihan, 1966; Rainwater, 1965; Clark, 1965). They have emphasized the constriction of these mothers' perception of alternatives due to such factors in the lower-class Negro ghetto as (1) continued and sustained effects of poverty, (2) frustration and depression at discrimination, (3) a realistic sense of impotency in the face of crime and vice in the ghetto, and most important, (4) disruption of the family in a situation in which as high as fifty percent of the fathers may be either absent or relatively ineffectual as providers of either financial or emotional support in the home, and in which mothers with children under age six constitute forty-one percent of the non-white labor force. Some preliminary study of the resultant behaviors of these Negro mothers suggests that:

> "The lower-class Negro mother has a difficult life and sees herself as responsible for the rearing of her children, with the assistance of neither a stable husband nor a friendly society. She feels that she must suppress children's internal impulses and that she must shield them from the threatening outside world. She cannot conceive of children's potential for developing inner control. Children are seen as objects to be carefully protected when young and helpless and then controlled, shielded, and suppressed as they grow older."[1]

Hence, the social realities of the lower-class Negro ghetto get translated into the cognitive and emotional experience of its individual members. In this instance, concepts of the mothers would possibly be functional to these children's achievements in school.

With regard to their cognitive behaviors, it has been found that lower-class Negro mothers are more likely to produce a higher

[1] N. Radin, The child-rearing attitudes of disadvantaged Negro mothers and some educational implications, J. Negro Educ., 34, 1965, 145.

number of relational-contextual responses on the Kagan Conceptual Style Test and also a greater number of nonscorable responses on the Adult Sigel Sorting Task, than middle-class Negro mothers (Hess and Shipman, 1966b; Shipman and Hess, 1965).

Cognitive personality theorists such as Kelly (1955), Klein (1958), Harvey, Hunt, and Schroder (1961) and others have suggested that the central dimension in the relation between cognition and personality functioning is the active-analytical versus passive-global dimension. Bernstein (1961) has demonstrated that a restricted, as opposed to elaborated, linguistic code is more characteristic of members of the lower-class community. If the social experiences of the individual members of the lower-class Negro ghetto act as previous research and other case study materials suggest, the more concrete, passive-global style of communication will be predominant (Davis, 1941; Kardiner, 1951). Conversely, however, a more active analytical approach by the mother to experiences of her child, especially those which pertain to learning in school, could be functional to his achievements. In the present study, behaviors presumed associated, on the basis of theory and previous research findings, with the more active, analytical approach were subsumed under the concept maternal individuation. These behaviors would be associated with (1) the concepts used by the mother in responding to specific interview items; (2) the application of these to conceptualization of her child as a person; (3) and to handling of typical child rearing problems. The influence of these behaviors upon the child would be threefold: (1) directly in terms of pressures for his school achievement; (2) directly in terms of giving credence to his sense of self-esteem; but most important, (3) indirectly in terms of engaging the child in a type of interactive process in his earliest environment which would produce more competent behavior in the next one encountered: the school setting.

Specifically, therefore, the three major hypotheses of this study were:

(1) Maternal variables would contribute significantly to the prediction of lower class Negro preschool children's actual school achievements.

(2) Maternal individuation, a cognitive maternal variable, will be more predictive of these children's level of achievement than primarily non-cognitive maternal variables such as warmth towards the child or social interaction of the mother.

(3) Children of mothers with higher levels of maternal individuation will demonstrate greater independence or autonomy within the school setting, than children of mothers of lower levels of maternal individuation.

Hypothesis I states that prediction of these children's actual achievements in the school setting will be associated with maternal behaviors of mothers in the lower class Negro ghetto. This has been a prevalent assumption, but has rarely been formulated into a testable hypothesis. Hypothesis II states that the more instructive or analytical dimensions of maternal behaviors will be more important to these children's competency in the school setting than the expressive dimensions. Specifically, teaching disadvantaged children how to solve problems relevant to their own experiences will be more crucial to their achievements in school than other maternal behaviors which are less directly associated with active problem solving as such. Hypothesis III states that mothers who engage in such instrumental behaviors will have children who seem more independent and autonomous in problem solving situations in these mothers' absence, than mothers who do not. Such children will appear more confident, and will have less anxiety about taking achievement tests.

2. Method

Since the major problem of this research was to determine the direction and kind of influence of selected maternal behaviors on the level of the lower class Negro child's achievements, the initial issues of the study included: (1) selection of an appropriate sample; (2) identification and measurement of the relevant maternal behaviors; and (3) selection of appropriate measures of these children's achievements. Each of these issues will be considered.

a. The research sample. The sample for this research was selected from a total population of 153 children and their mothers who were currently enrolled in a summer (1965) Head Start program in the urban Chicago area. From initial screening of the population, ninety children and their mothers were eligible for the present study. In the final sample there were forty-five boys and forty-five girls. The mother of each child was considered to be the woman with whom the child resided who was primarily responsible for decisions regarding the child's daily care and welfare.

Although initially, the index of social status was a prestige rating of the occupation of the family's principal wage earner, using Bevode McCall's Index of Occupational Status Characteristics, families used in this study also met other criteria for lower status social position. Over fifty percent of the parents were born in southern states. The average family income was between $4500-5000 per annum, but this figure applied to a family of six: two adults and four children, with the average monthly rental being between $105-120.00.

As primary emphasis was to be upon the role of selected maternal behaviors for the disadvantanged child's achievements, no child with identified severe medical or emotional problems was included in the present sample. The ages of these children ranged from 53 to 66 months (mean age = 60.3; s.d. = 3.6), and their Stanford Binet I.Q. scores were comparable to those found with other lower income groups in urban areas (mean I.Q. = 92.5; s.d. = 13.1; range = 58-129). The mean age, educational level, and number of children of the mothers were 31.4 years (s.d. = 7.2), 10.7 years (s.d. = 1.7), and 4.0 (s.d. = 1.9), respectively. Table 1 presents the association between father absence and working mothers in the present sample, based on a total sample of 90.

	Father Present	Father Absent
Mother working	43 (N=39)	19 (N=17)
Mother Not Working	31 (N=28)	7 (N=6)

Table 1

b. The maternal behaviors: selection and assessment

The seven independent variables of this study were assessed from maternal interview data collected by female middle class Negro interviewers trained by this researcher. Each variable was assessed from seven indicators. These indicators were primarily the self-reported behaviors of the mother. Using a procedure similar to that developed by Dyk and Witkin (1965), interview data were examined for the presence (+) or absence (-) of the identified maternal behaviors. The final rating for each of the seven scales was the sum of the plus indicators (a score of 1= all indicators coded minus (-)). The interview itself was originally designed by this researcher for a larger study (Hess, Kramer, Slaughter, 1966).

Maternal behaviors assessed in the study pertained to the following seven variables: (1) value for school achievement, (2) warmth towards the child, (3) social interaction of the mother, (4) concepts used by the mother, (5) individuation of the child's personality, (6) cognitive controls used with the child, and (7) cooperation with the interviewer. The first three variables have been found to be associated with middle class children's achievements (Crandall, 1963; Harris, 1961; Kornrich, 1965) and so were reintroduced in the present study. Variables four to six comprised maternal individuation, the concept used in the study to refer to those maternal behaviors which could be cognitively stimulating to the child. The variable, cooperation with the interviewer, was introduced as an important control variable, since all the variables were assessed from interview data. The variables and indicators are presented below.

(1) value for school achievement

1.	The mother finished high school at least, versus	The mother did not finish high school.
2.	The mother hopes her child will finish college, and states she expects him to finish high school at least, versus	The mother hopes her child will finish high school but does not expect him to.
3.	The mother reports belonging or having belonged to the local school PTA or other such organization(s) in the school, versus	The mother reports no participation in any school activities.
4.	The mother reports having aspired to some occupation which would take training beyond high school, versus	The mother does not report having aspirations for professional work.
5.	The mother emphasizes that she has told her child that school is a place to learn, versus	The mother does not particularly emphasize school as a place to learn.
6.	The mother gives some indication that she encourages this child in new learning at home, either by taking pleasure in his school work and adjustment to school, and/or in the kind of games and activities they participate in together, versus	The mother does not now push her child towards learning which could be helpful to him in the school setting. Unlike the other mother, she is also not likely to see herself as an agent in his future success.
7.	The mother sees this child as being capable of a high level of school achievement in that she describes him as being more intelligent or intellectually inquisitive than other children, versus	The mother does not see this child as being particularly more capable of school achievement than other children.

(2) warmth towards the child

1.	The mother states that she believes she is close or very close to her child, versus	The mother states that she is somewhat close, or not too close to her child.
2.	The mother reports that she rewards her child for good behavior, usually with expressive gestures such as a hug or kiss, or with a sincere thank you, versus	The mother reports rewarding her child primarily with material items such as candy, money, or toys. Any other gestures of affection are incidental as the mother believes the child prefers the former.
3.	The mother reports that she believes understanding, consideration or friendliness to be important qualities for her child to develop as he grows older, versus	The mother does not specifically emphasize these qualities for her child to develop as he grows older.

4.	The mother reports that she enjoys playing with her child, and that she encourages play between herself and him, versus	The mother does not report encouraging or enjoying play between herself and her child.
5.	The mother reports that she wants to be closer to her child than her own mother was with her, or at least as close, versus	The mother does not report any desire to experience more closeness with her child or as much as she had with her own parents.
6.	The mother describes her child primarily using positive adjectives or adjectivial phrases, versus	The mother is likely to use negative adjectives and phrases in describing her child, even when her intent is to praise him. She may also praise him by reason of the absence of some behavior rather than the presence of another.
7.	The interviewer reported experiencing this mother as a warm, friendly or affectionate person, versus	The interviewer does not report experiencing this mother as a warm person.

(3) social interaction of the mother

1.	The mother reports that she regularly attends church more than twice a month, versus	The mother does not report attending church at least twice a month.
2.	The mother reports working at a job regularly--more than twenty hours a week, versus	The mother does not report working regularly.
3.	The mother reports that she belongs to one or more local community groups such as block clubs or church groups which she meets with regularly, versus	The mother does not report belonging to such local community groups.
4.	The mother reports membership in groups whose influence is more likely to extend beyond the immediate community, such as the NAACP, versus	The mother does not report membership in any group whose influence extends beyond the immediate community.
5.	The mother reports that she holds or has held, some responsible leadership position in a community group, versus	The mother does not report currently holding, or having held, a leadership position in some community group.
6.	The mother reports some racial discrimination in regard to herself or members of her family, versus	The mother having faced no discrimination because of her or her family's ethnic identity.
7.	The mother describes an active day in which the members of the family function as a scheduled unit with regard to responsibilities, versus	The mother describes a day which is quite routine, and in which the family members tend to go in separate, undefined directions.

The following variables focus more on the analytical dimensions of the mothers' behaviors. These behaviors could be, according to previous theory (Hess and Shipman, 1965; Harvey, et.al., 1961; Bernstein, 1964; Wallach, 1962) and research (Hess and Shipman, 1966; Bear, Hess, and Shipman, 1966), more cognitively stimulating to the child.

(4) concepts used by the mother

1. The mother voluntarily considers alternatives in the solution of some hypothetical child-rearing problems, versus	The mother appears to see only one "right" solution to whatever the problem, with little or no reference to alternatives.
2. The mother can assume an attitude of the mere possible where indicated, and plan ahead to future events and possible courses of action, versus	The mother is not oriented toward planning for the future, either for herself, or the members of her family.
3. The mother has perspective upon the experiences of herself and her family in the present and past and uses this to solve problems presented to her, versus	The mother has little perspective upon direction of her own life or the lives of the members of her family.
4. The mother can compare two items or classes of events on demand, versus	The mother has difficulty comparing any two items or classes of events.
5. The mother thinks in terms of the age-appropriateness of her child's behaviors and so does not see him as little more than a miniature adult to whom she responds, versus	The mother does not think in terms of the age-appropriateness of her child's behaviors, nor of her responses to him.
6. The mother is usually able to take the role or position of another, such as family members or the interviewer, and does not assume that what she states is easily or always understood, versus	The mother appears to assume there is little or no need for any explanation to others.

(5) individuation of the child's personality

1. The mother sees this child as quite distinct from other siblings in the family and so characterizes him very definitely on more than one personality trait, versus	The mother reports that she sees this child as being just like all other children in the family, and may make a point to treat him as such.

2. The mother anticipates that this child will differ in some ways from other children in preschool and kindergarten, versus	The mother does not anticipate that her child will differ, either positively or negatively, from other children in preschool and kindergarten.
3. The mother envisions her child as being quite capable of being independent as indicated by her pleasure in seeing him do things for himself, versus	The mother tends to see her child's behavior primarily in terms of whether it pleases or displeases her, rather than in terms of his own development.
4. The mother's description of her child's interests and activities distinguish him readily from those of other children, versus	The mother's descriptions of her child's interests and activities are not specific enough to indicate that she herself readily knows what his particular interests are.
5. The mother's report of her child's behavior suggests that this child has few symptoms which could indicate emotional problems, versus	The mother's report of her child's behavior does indicate that this child has several such symptoms.
6. The mother's description of some of her child's characteristic moods distinguish him quite readily from other children, versus	The mother's description of her child's characteristic moods does not distinguish him well from other children.
7. The mother keeps a regular schedule for this child; in her absence she has someone to care for him, versus	The mother does not give any indication of keeping a regular schedule for this child, nor of having some mature person care for him in her absence.

(6) cognitive controls used with the child

1. The mother reports having discussed with her child what to expect or to anticipate in preschool with regard to teacher, other children, new activities, and so forth, versus	The mother reports telling her child very little about what to expect in preschool. She either focused upon what he should do, or told him nothing at all.
2. The mother reports being an agent in her child's awareness of his own ethnic identity, or that she plans to be when he is older, versus	The mother does not report being or planning to be, a positive agent in her child's awareness of his awareness of his ethnic identity.
3. The mother reports using primarily verbal controls to punish her child, versus	The mother reports using primarily physical controls to punish her child.

4.	The mother emphasizes the importance of developing guidelines by her child to get along in the world, versus	The mother emphasizes little in the way of specific guidelines for her child in order to get along. Her emphasis may be upon passivity rather than active coping.
5.	The mother reports having models for her child to emulate, versus	The mother reports having no models for her child to emulate.
6.	The mother places some restrictions upon her child's behaviors such as in terms of his associates and activities, versus	The mother reports placing no restrictions in these areas.
7.	The mother gives no indirect evidence of feeling out of control or having lack of control of her child's management, versus	The mother does not appear to feel in control of her child and his behaviors.

The final maternal individuation score was the mean rating of the last three variables. The seventh variable, cooperation with the interviewer, refers specifically to behaviors which were shown by the mother during the interview and for the sake of brevity will NOT be presented. (These behaviors were primarily reported by the interviewer.)

c. The children's achievement behaviors: definition and assessment

The dependent variable in this study was the level of intellectual achievement attained by these preschool children. Evaluation of this was made from standard achievement situations, including several tests and ratings by school personnel. The following tests and ratings were used:

1) The Stanford Binet (Form LM): Only the index of mental age was used as a measure of these children's cumulative intellectual achievement to date. This test was individually administered to 89 of the 90 children in this study by trained psychometricians during the first four weeks of the summer program.

2) The Caldwell-Soule Preschool Achievement Inventory (PAT): This test was individually administered by classroom teachers during the first three weeks of the summer program. Since a partial score based on 49 of the original 152 items correlated .95 with the total test result, this partial score was used as the measure of these children's achievement in this study. The Caldwell-Soule PAT was specifically designed as a kindergarten readiness test for use with low income children. Principal component analysis suggested (Caldwell, 1966) that the following dimensions contribute to the child's final score: (1) concept activation, (2) independent action, (3) personal-social responsiveness (to roles in the community), and (4) associative vocabulary. Scores were available on 80 of the 90 children in the present study.

3) The Metropolitan Readiness Tests: These tests were group administered in the fall of 1965 to 81 of the 90 children in this study. These tests evaluated the children's readiness for using number and verbal concepts. In a recent study by H. Robinson (1965) retest reliabilty coefficients ranged from .91 to .95 on the subtests for urban disadvantaged children. In the present study only the child's number readiness was analyzed separately from his total score.

Several achievement ratings were also completed by classroom teachers, psychometricians, and observers of the children (present in the program during the entire summer program). These ratings were utilized in the present study because they specifically focus upon behaviors of the child which are frequently seen as more or less achievement oriented by school personnel. These ratings were summary scores of items derived from principal component analyses of E. Ziegler's Behavior Inventory (Hess, Kramer, and Slaughter, 1966). Three factors rated by both teachers and observers were:

4) Achievement Orientation
5) Verbal-Social Participation
6) Independence

Two similar ratings were completed by the psychometricians: using the Stanford Binet face sheet rating scales.

7) Achievement Orientation
8) Confidence in Ability

Finally, both teachers and observers at the conclusion of the summer program predicted the level of these children's future grade point average, based upon observation of their summer performance. These ratingswere used as additional indices of these children's achievements to date.

9) Grade Point Achievement

d. Testing the hypotheses of this study

The general procedure for testing the hypotheses of this study was to determine the association between the maternal behaviors and the various achievement measures used. Specifically, a finding would have additional validity if it were to be consistent across all measures of these children's achievements. In the following analysis of these findings evidence for the reliability and validity of the maternal and child measures will also be presented.

3. Results

Generally, the results of this study were positive: maternal behaviors in the lower class Negro community were associated with the level of these preschool children's intellectual achievements.

The reliability of the maternal behavior scales was assessed by percent agreement between two raters who independently coded 18 (20%) randomly selected interviews. Reliability training, in addition to design of the original scales was completed on a separate set of similar maternal interviews obtained from another disadvantaged urban community. The average percent agreement over the 48 indicators was 0.825. Percent agreement over the seven scales ranged from .762 to .929. The mean number of disagreements per matched interview was 6.2.

Preliminary analysis of the seven interview scales indicated that (1) scores on the scales were generally normally distributed; (2) certain items contributed more towards a higher score on each of the seven scales than others. These items included indicators 1, 5, and 6 on scale I (value for school achievement); 3 and 6 on scale II (warmth towards the child); 6 and 7 on scale III (social interaction of the mother); 3 on scale IV (concepts used by the mother); 1,3,4, and 7 on scale V (individuation of the child's personality); and 2,3,and 4 on scale VI (cognitive controls used with the child), (3) no significant differences by sex of the child existed in either the distributions, mean scores, or percent of positive (+) indicators chosen among these maternal behaviors, and finally, (4) only one of the seven maternal variables was significantly associated with either the age, educational level, or number of children of the mothers: value for school achievement was associated .44 with mother's attained educational level ($P<.01$).

In summary, preliminary analysis of the maternal interview scales indicated that they could be reliably coded and that within this economically and ethnically homogeneous group mothers could be behaviorally distinguished. Immediately, the issue of whether these maternal behaviors would have psychological significance was raised.

With regard to the measures of these children's achievements, girls tended to be slightly higher acheivers than boys on the standard achievement tests, but not the achievement behavior ratings. An intercorrelation matrix indicated that (1) achievement test scores of these children were highly intercorrelated and demonstrated the same pattern of association with the achievement behavior ratings, and (2) psychometrician, teacher, and observer ratings on the same variable were more highly associated than either teachers' or observers' ratings of different variables. Generally, the more specific the rating to the child's school achievements, as contrasted with achievement oriented behaviors as such, the higher the level of agreement between teacher, observer, and psychometrician's ratings. From these findings it was concluded that the measures utilized in the present study were viable indices of these children's intellectual achievement behaviors. This was particularly important to establish since only minimal reliability training and validation of these achievement measures was possible before these data were collected. Furthermore, no one measure of achievement of preschool children in general, or disadvantaged children in particular, has yet to be satisfactorily devised.

TABLE 2
RELATION OF MATERNAL VARIABLES TO THE LEVEL OF THE CHILDREN'S ACHIEVEMENTS

CHILD VARIABLES: VARIABLES-MATERNAL	BINET CA (N=90)	BINET MA (N=89)	PAT (N=80)	METRO NUMBER (N=81)	METRO TOTAL (N=81)	GRADE PT TEACHER (N=88)	GRADE PT OBSERVER (N=65)	ACH ORIENT TEACHER (N=90)	ACH ORIENT OBSERVER (N=89)	ACH O PSYMT (N=83)
Value for School Achievement	-.12	.24*	.21*	.20	.14	-.18	-.10	.20*	.02	.06
Warmth Towards the Child	-.02	.20*	.19	.07	.18	-.05	-.16	.04	.07	.10
Social Interaction of the Mother	.02	.25*	.31**	.24*	.11	-.12	-.25*	.17	.12	.03
Concepts Used by the Mother	-.02	.22*	.17	.16	.10	-.11	.02	.10	.01	.13
Individuation of the Child's Personality	.02	.30**	.30**	.19	.21*	-.22*	-.05	.14	.02	.14
Cognitive Controls Used with the Child	.03	.37**	.33**	.30**	.30**	-.34**	-.30*	.26*	.12	.26*
Maternal Individuation	.01	.38**	.34**	.31**	.28**	-.26*	-.17	.20*	.09	.23*
Cooperation with Interviewer	-.19	.05	.06	-.05	-.08	.01	-.12	.02	-.04	.03
Age of Mother	.11	.21*	.20	.16	.11	-.00	-.22	.12	.07	.07
Educational Level Attained by Mother	-.15	.06	.05	-.02	.07	.01	.04	-.04	.10	.10
Number of Children of the Mother	.04	-.05	-.08	-.05	-.19	.25*	.02	-.11	-.17	.11

$**p < .01$, $*p < .05$

The data in Table 2 present evidence in support of hypotheses I and II (p.6). Specifically, maternal behaviors, especially those which it is hypothesized will be more cognitively stimulating to the child, are associated with the level of these children's actual school achievements.

In a separate analysis children of mothers of higher levels of maternal individuation tended uniformly to receive a higher level of achievement on all achievement measures, than children of mothers of low maternal individuation, whether or not these mothers had (1) a higher value for school achievement, (2) more warmth towards this child, or (3) a greater amount of social interaction. (High maternal individuation = a score greater than 4.6; low maternal individuation = a score less than 3.1). Whether or not the mother worked or the father was present in the home did not, however, noticeably influence the level of these children's achievements.

The data did not support the third hypothesis of this study, that children of mothers with higher levels of maternal individuation would show more independence, than children of mothers of lower levels of maternal individuation. Teachers and observers did not see these two groups of children as noticeably different in the classroom setting. Psychometricians, however, did distinguish between the two groups of children on confidence in ability in the testing situation: children of high individuating mothers received a mean score of 5.02 (7 point scale), as contrasted with a mean score of 3.72 for children of lower individuating mothers (s.d.'s = 0.98 and 1.21 respectively; t $<$.01). Although there is certainly the possibility of the "halo effect" with regard to the psychometricians' ratings, possibly these personnel were better equipped to evaluate this dimension of these children's behaviors than the other raters.

A separate principal component analysis of the seven maternal interview scales with a varimax rotation to a two factor solution was completed in a partial effort to interpret the psychological meaning of the scales. The variables warmth toward the child, cognitive controls used with the child, and individuation of the child's personality loaded .808, .793, and .660, respectively on Factor I and .160, .019, and .489 on Factor II. The variables social interaction of the mother, value for school achievement, and concepts used by the mother loaded .739, .705, and .595 on Factor II, and .050, .143, and .336 on Factor I. Examination of the items suggested that the first Factor I might be termed Openness of Communication between Mother and Child. It represents an important dimension of the maternal control system referred to by Hess and Shipman (1965), with an important addition. Mothers influence the achievement behaviors of their children by giving them relevant information and by achieving deliberately a certain degree of closeness or rapport, possibly so that this information might be accepted. In any case, the entire process involves actively engaging the child in a communicative process between mother and child. Factor II refers to the use by the mother of even the minimal positive resources in her community, including opportunities for work, recreation, and participation in school activities, in addition to her awareness of broader social issues. As such, Factor II might be termed Degree of Social Isolation of the Mother.

Introduction of the following variables into a multiple regression equation with Binet mental age as the dependent variable increased the multiple R to .442, significant at the .01 level (df = 1/85): cognitive controls used by the mother, value for school achievement, social interaction of the mother, and individuation of the child's personality. However, separate analysis of the residuals suggested that taken independently, only cognitive controls used with the child reached significance at the .01 level.

4. Conclusions and Implications

Maternal behaviors have been found to have a significant influence upon the achievements of lower class Negro preschool children. Specifically, maternal individuation, a concept developed for this research to describe the more active, analytical aspects of these mothers' behaviors, was associated with measures of these children's actual school achievements. The influence is reflected in different aspects of the children's achievement efforts, including (a) their initial cognitive abilities upon entrance into the school setting, (b) their behavior readiness for school, (c) their achievement efforts as seen by relevant school personnel, and (d) their continued level of performance upon entering kindergarten following a preschool Head Start program. There is some indication that the two important dimensions of maternal behaviors which contribute most to these children's achievements include: (1) open communication between mother and child, and (2) degree of social isolation of the mother. The extent to which the mother actively establishes this communication with her child, in particular, and the degree to which she utilizes even the minimal community resources available to her own experiences both act to determine the level of her child's achievements. These findings are consistent with those of other researchers who have emphasized the importance of maternal behaviors in the development of children's cognitive abilities, most notably the work of Hess and Shipman (1965). Furthermore, the findings indicate that those behaviors which are relevant to these children's achievements parallel those found in middle class communities.

In regard to the maternal variables incorporated into this study, measures of these children's achievements in standard achievement test situations are more usable measures of their achievements than specifically achievement oriented behavior ratings. However, the more closely identified the ratings with prediction of these children's actual achievements in the school setting, the more likely they were to be usable. Limited preliminary training on the rating procedures perhaps contributed most to this finding, however. Further research is needed to determine if training in behavior ratings with this population could be productive of more results than those of the present study.

The findings are not consistent with those studies which emphasize the differential influence of maternal behaviors upon children's achievements depending upon the sex of the child. Girls in the present study, however, tended to perform more successfully in standard achievement test situations than boys, and mothers of girls at times demonstrated more of those behaviors found associated with higher levels of achievement, than mothers of boys. Generally though, these findings suggest that at this age maternal behaviors associated with higher levels of achievement in lower class Negro children do not significantly differ for girls or boys.

Another finding inconsistent with previous reports such as that of Moynihan (1966) is that the relation between father absence, number of children, age, and educational level of the children's achievements is insignificant. No association between any of these demographic variables and the present measures of these children's achievements was demonstrated in the study. With the lone exception of a .44 ($p < .01$) correlation between mothers' value for school achievement by their children and their own attained educational level, no association between any of these demographic variables and the maternal behaviors identified in this study was demonstrated. This finding suggests that within the lower class community more subtle factors operate to depress these children's level of academic achievement than simply the presence or absence of the father in the home, whether or not the mother works, or how many children she currently has in the household. In a subsidiary study, for example, mothers' value for school achievement correlated -.36 ($p < .01$) with their sense of potency with regard to influence of the schools, while warmth towards the child correlated -.24 ($p < .05$) and .23 ($p < .05$) with support for traditional educational values and negative attitude towards the teachers, respectively. The finding indicated that mothers who tend to project hostility onto the school are likely to be more supportive toward their preschool child. This material is presented in support of the position that further research to determine the association between different maternal behaviors within this community is crucial.

A major subsidiary finding of this research, therefore, is that maternal and child behaviors within an ethnically and economically homogeneous community such as the lower class Negro ghetto can be differentiated which have psychological significance. Certainly the maternal scales utilized in the present study are value-laden: it was assumed that what would be functional to children's achievements in the middle class community would also be functional to the lower class ghetto child's achievements. The data present some evidence in support of this assumption. In future studies other important maternal behaviors may be chosen for other reasons and found more crucial.

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C. Cognitive Interaction Between Teacher and Pupil in a Preschool Setting

Principal Investigators: Robert D. Hess and Virginia C. Shipman

Project Director: Carla Berry

This study is concerned with the evaluation and standardization of coding categories that have been developed for use as an observation and research tool in analyzing teacher behavior. The categories were derived from research on maternal teaching styles conducted by the principal investigators; this project attempted to develop the scales more systematically and apply them to teachers' classroom behavior in preschool situations. As with the previous research, the emphasis is on cognitive interchange rather than love-hostility and autonomy-control dimensions.

It is a methodological study, designed to provide an evaluation of the reliability and feasibility of the coding system under different environmental conditions and to establish the necessary controls for its use. Questions and issues being addressed are the following:

1) Unitizing by "grammatical" or "response" message units.
2) The qualitative and quantitative relationships between coded verbatim transcripts and observer-coded transcripts.
3) Significance of amount of verbalization per se for cognitive stimulation.
4) Individual teacher consistency in verbal output especially in the cognitive area. If the amount of cognitive speech varies, what are the important conditions?

5) The usefulness of time sampling versus activity sampling. If activity (play vs. games vs. "juice time" vs. rest period) is an important variable, it may be advisable to code (record) at selected times when the teacher's speech will be typical of cognitive elements.
6) The interaction with type of classroom orientation: teacher-traditional (child-directed); structured; specific task-oriented.

The realization and demonstration that varying teaching strategies used by mothers had a significant effect on the learning behavior of their four-year-old children in an experimental learning situation (Hess and Shipman, 1965) gave impetus to our concern to investigate the verbal strategies employed by teachers in the preschool classroom. It was recognized that not all cognitive development proceeds on a verbally mediated level. However, it is accepted that this is one of the most important ways in which conceptual thought is developed and demonstrated. It is also one of the most available for observation. This project is, therefore, focused on the analysis of the teacher's verbal behavior in the classroom.

The project originated in the spring of 1966. It was pursued until January, 1967, when the director went on leave of absence. Except for the transcribing of the recorded classroom sessions, work was not resumed on this project until fall, 1967. The following, therefore, is a progress report rather than a final report on the project.

In evolving the coding categories, all speech was considered important. It is not clear at this time where the line may be drawn between explicit and implicit cognitive stimulation. We believe there is potential cognitive stimulation contained in speech even when the teacher is not specifically involved in formal teaching situations. For instance, we regard the way in which controlling statements are made as a possible transmitter of a cognitive approach (cf. Bernstein) through the use of "reasoning" or "alternatives" rather than peremptory commands. It may be important whether a teacher asks questions or merely tells the children. One method may demand the use of concepts and the active participation of the child while the other allows him to be passive. It is also felt that at the preschool age we are dealing with what Bruner calls the "pre-cursors" to cognitive development — those attitudes which improve the quality of data processing such as preliminary orientation and focus. Therefore, within this framework we evolved a set of coding categories which allow us to tabulate the different types of communication used in the classroom and which separate the more explicit cognitive statements into increasing levels of complexity.

The first months of the project were used in developing the original coding scheme and in observing in two nursey schools. (One of these was a Head Start class in a low income Negro community; the other a laboratory school in a professional, high income white area.) All speech was divided into four areas: 1) instructive speech, 2) control functions, 3) general communication which has cognitive implications, and 4) neutral statements. The teachers' statements were then coded within each area in terms of the cognitive skills used or demanded. During this pilot period we also investigated the use of a cordless microphone which transmitted to an FM tuner to record on tape all the teachers' statements and the use of different coding formats by an observer in the classroom. Earlier we had found that a tape recorder is ineffective in picking out a teacher's voice in the complex and noisy nursey school world.

This preliminary classroom observation indicated that meaningful data could be obtained when one used activity or functional sampling, but not time sampling, since the activity structures the data obtained. Preliminary analysis of teacher behaviors in a nursery school setting revealed striking differences in the proportion of cognitive versus non-cognitive (affective, disciplinary) interchange for head teachers and assistant teachers.

In the fall of 1966 four Chicago classes were selected for further observation. These classes were chosen to represent potentially different teaching styles. The first was run by a well-established settlement house and represented the child-centered, permissive atmosphere. The second class was run by a Montessori school along a modified Montessori philosophy. The third and fourth classes were both Head Start classes sponsored by the Chicago Archdiocese which were also part of our evaluation sample. Both might be termed eclectic in approach with differences related to the personality rather than philosophy of the teacher. Three of the schools had a population of deprived Negro children; the Montessori school included middle and lower income white and Negro children.

Seventeen class sessions were taped, with a minimum of three sessions per class. Observations were scheduled to give balanced representation of activity periods. The teachers wore a cordless microphone which transmitted to an FM tuner hooked to a tape recorder. The teachers did not object to wearing the mike, and it did not seem to interfere with their activity. An observer (Dr. Berry) also kept a log of activity to coordinate with the taped session. The observer experimented with different "on the spot" coding formats but decided to concentrate on a log of activity in order to interpret the tapes accurately. It is important to know where the teacher is and to whom she is speaking. In addition, the activity area and classroom curriculum are important variables which affect the amount and type of speech used. For instance, during free play the teacher seems to make more controlling statements than during juice time. There is likely to be a higher proportion of cognitive statements in the puzzle corner than in the doll corner. We are interested in documenting such variations within a given school as well as between schools of differing philosophy.

It is clear at this point that one cannot adequately survey teacher behavior in a nursery setting without a mechanical assist (such as a microphone). This is particularly true in classrooms where emphasis is put on individual contact (i.e., Montessori, or the extreme child-centered program). It may be possible, however, to avoid the tedious task of transcribing and typing by having the microphones feed into earphones worn by the observer who does the coding. It was found that the observer could not code verbal behavior directly without a mechanical aid, i.e., earphones which picked up the broadcast from the cordless microphone. This, of course, limits the mobility of the observer, but it is necessary if he codes on the scene. Our present preference, however, is to use the observer in the class to write down a simultaneous log of activity and to code directly from the tapes at a later time. This avoids losing the data and allows for more studied discriminations, especially in speech which extends over several sentences.

Practical difficulties do arise which affect the quality of the tapes and the amount of verbal behavior intelligible from the tapes. Locations vary in the amount of external broadcast interference on the FM band. Also, size and shape of the classroom can affect the quality of transmission. Despite these technical difficulties, it is felt that the use of a cordless microphone is an absolute necessity in the preschool class. With it one picks up the asides, personal remarks, and comments to the individuals which are components of "style" and which are lost in general observation. (This is particularly true of the teacher who strives for individual communication rather than group speech.)

At present the seventeen transcripts are being coded and analyzed. This is considered a trial coding and it is our intention to refine the categories as we proceed. A tentative change in the categories for explicit cognitive statements is enclosed (see Appendices A and B). It will then be necessary to establish the practical viability and reliability of the categories. This will involve training one or more coder-observers who will use the observational material now available and also test the categories in new observations. When it has been ascertained that the coding categories can be used reliably by different judges, we will analyze them for internal consistency measures on individual teachers, for variations between teachers, and for variations related to activity areas and group structure in the classroom.

Analysis of the data from the Head Start classes will allow assessment of the similarities and differences between the two observation schemata (i.e., between this coding system and the ORF) and provide more detailed analysis of one aspect of the teacher's behavior, her verbal behavior to the children.

Since the initiation of the teacher observation project, there have been several schemes used in the national Head Start evaluation program which have also tried to focus on the teacher. It appears that the Observation of Substantive Curricular Input (OSCI) developed by Dr. Carolyn Stern has several aspects which can be incorporated into our coding scheme. Although the OSCI does not focus on verbal behavior, the overview of the classroom does give the background information which we feel is necessary to investigate the variables which effect the rate and type of speech. All the observations contain a Context code which could be used instead of the more diffuse "Activity Area" code used in our original categories. It must be noted that the context code is based on what the children are doing. It may be necessary to include new codes which account for teacher behavior when she is not involved with a child. Other codes will no longer be appropriate and will automatically be dropped. However, it seems economical to use a system already in operation whenever possible. Another facet of the OSCI is the documentation of the group structure in the classroom. We feel it is important to know to whom the teacher is talking. Therefore, we shall be working out ways in which these two systems can be used to advantage in the Cognitive Coding.

APPENDIX A

COGNITIVE CODING CATEGORIES FOR TEACHER VERBAL BEHAVIOR

I. Precursors

PR -- Precursor Attitudes

o - orienting
m - motivating intellectual interest
f - focusing on a relevant detail
ant - setting up an anticipatory pattern of looking ahead which may involve delay

II. Data Processing

IS -- Input in simple form

lab - labelling
des - description
ct - counting
vc - verbal communication which is generally informative, but not focused (e.g., comment or answer to a question)

DS -- Demand in simple form

lab - labelling
des - description
ct - counting
vc - verbal communication in form of a question, asking for simple information

IC -- Input Complex

cogd - cognitive discrimination; all sensual and perceptual comparisons, similarities and differences. Includes more difficult number concepts, as well as other quantitative concepts and references to size and shape.
enr - enrichment, elaboration, including associations to past and future
def - formal definition
sqch - sequence chain; connected events, but the relationship need not be causal or even explained
jdg - judgement, and evaluation (e.g., "ready" "enough")

DC -- Demand Complex

same as IC except that the form is one of a demand or question

III. Goal Directed Specific Behavior

IGO -- Input goal directed; planning and explanations

rs -- Reasoning
ps -- Problem solving

DGO -- Demand Goal Directed Behavior

rs -- Reasoning
ps -- Problem solving

IGS -- Input is general strategy for solving a problem or type of problem. It can involve a method such as measurement. The problem can be a social problem, and having a "talk". Emphasis is on the strategy.

pl -- Planning
alt -- Alternatives

DGS -- Demand General Strategy

pl -- Planning
alt -- Alternatives

APPENDIX A (CONT'D)

III.

Level I. Teacher Input: Simple or Preparatory

CODE	BEHAVIOR	EXAMPLE
Io	1. Orienting Always an initiatory statement in a sequence. The sentence might be directions or a question and it is the relationship to the subsequent activity that makes it relevant.	"Now we are ready for work, Laura." "Let's see what's in here."
Ia	2. Anticipatory Patterning An attempt to orient the child to the future requirements or activities so that he can prepare and also develop a sense of sequence and time.	"In five minutes, when the big hand is here, it will be time." "Now we'll get the salt and then the soap and then the water."
Il	3. Labelling Basic naming of objects. Denotation	Says names of colors as they are given out.
If	4. Focusing Delimiting the relevant area for more precise or detailed attention. Usually follows a more general statement.	"You can see the roots of the plant down here. Notice those little white things."
Id	5. Describing Reporting perceptual details and/or qualities, and/or action.	"The front door is there, that must be the back door." While eating a grape: "Delicious, indescribably delicious."

	Level II. Child's Response is Demanded by Teacher Stimulus. Simple	
IIe	1. Labelling	"What color is this?" "Show me the yellow one."
IIf	2. Focusing	When looking for differences: "Show me which part is different. Look closely."
IId	3. Describing	"What is he doing? Tell me about it."
	Level III. Teacher Input: Complex	
IIIdf	1. Defining function	"A bulldozer is a machine to move dirt and push heavy things."
IIIdt	2. Defining thematic-relational	"A family has a mother and a father and children all living together."
IIIE	3. Elaboration Usually after a denotative or defining statement which is then enriched.	"That's the big hook and ladder. That's the biggest fire engine of all."
IIIR	4. Relationships: Comparisons Similarities and Differences	"They are all purple except one." "These two envelopes say the same word."
IIICF	5. Simple Reasoning: rudimentary concept formation. Cause and effect. Logical consequence but without the formal structure implied in Levels V and VI.	"The longer you roll, the longer and thinner it will get." "Squeeze the sponge so not so much water - you'll slip if you have water on the floor."
	Level IV. Child Demanded Response to Specified Cognitive Operations	
IVdf	1. Defining by Function	"What is this used for — what does it do?"
IVdt	2. Defining by theme and relation	

Level IV (cont'd)

IVE	3. Elaboration of detail	A probing question which would follow an initial request for a label or description. "Tell me more about your picture." "Why did he do that? Tell me about it."
IVR	4. Relationships	"Which one is just like the other?" "Find another one with the same color."
IVCF	5. Concept Formation Simple reasoning, cause and effect	"Where can we find the biggest, the largest?" "How many are there?"

Level V. Teacher Strategies related to goal-directed behavior

V comp.r.	1. Complex reasoning May include other types of logical constructions, but they are combined in a way to make a point — goal-directed. The goal is less specific than that in problem solving.	While making a pinata: "The balloon gives us the shape, so that we will have a nice round shape... remember the yarn. It was just yarn and then we put it in paste and it kept its shape, and now the newspaper will keep the balloon shape."
V SqCh	2. Sequential Chains Emphasis is upon the necessary sequential nature of two events, linked to a point which the teacher is trying to explain.	"No, the water instead of staying, of hitting the top of the jar — there won't be any cover so it will just get mixed in out air. But if you keep it covered, then the water will stay in."
V Prob	3. Problem Solving The thought process is linked to a specific, goal-defined need in an attempt to find a solution.	After having spilled water on the floor: "Mrs. Jones spilled it on the floor — that's why I put the paper there."

Level VI. Child Demanded Response of strategies to a goal, but with unspecified means

VI cmp.r.	1. Complex Reasoning Less immediate or specific consequences, than SqCh. Also includes analogies, references to other situations, etc.	"What would happen if I put the mouse way up high in the tree? Could he live up there?"
VI SqCh	2. Sequential Chains More immediate and limited in scope than comp. reas.	"What would happen if we put clay on the table after juice spilled and we didn't wipe it up?"
VI Prob	3. Problem Solving	"What kind of juice is it — without tasting it?"

Level VII

VII Strat	1. Coaching on Strategy Teacher indicates a general technique for solving a problem.	"Don't taste it. You could smell it, or look at the color." "Well, bring them in; we'll plant them and see." "You don't say 'J-I-M', we say JIM; we don't say 'A-T'. We say AT; we put it together."
VII Alt	2. Alternative solutions	"Do you have a fire engine? Do you want one? Well, you could line up chairs to make one or build one out of blocks."

APPENDIX B

ORIGINAL CODING CATEGORIES: TEACHER OBSERVATION

Behavior Related to Cognitive Development

I. Activity Area
    1. Free play inside
    2. Story
    3. Art and/or projects
    4. Organized games
    5. Snack
    6. Organized learning situation
    7. Outside

II. General Areas of Communication
    1. Affiliatory
    2. Help
    3. Seeks information (not cognitive)
    4. Reinforcement - reward
    5. Preparation for an activity
    6. Reflection and Interpretation of others feelings
    7. Reflection of own feelings and motives

III. Cognitive Area - Verbal (see Appendix A)

IV. Control Strategies - Verbal

    A. Simple
        1. Command
        2. Options: a) request b) motivate c) alternatives
        3. Permission

    B. Complex - with reasoning
        1. Command
        2. Options: a) request b) motivate c) alternatives
        3. Permission - qualified or with reasoning
        11. Command, status rules
        12. Command, personal-social
        13. Command, cognitive-rational
        21. Option, status rules
        22. Option, personal-social
        23. Option, cognitive-rational

Additional Summary Judgements: Scales 1-4 Areas Affecting Cog. Dev.

V. Degree of Differentiated Organization in the Room (Home)

1. Definite organization of time with activities
2. Clearly organized play equipment - arranged for child's access and responsibility
3. Clearly established (authority) roles
4. Definition and differentiation of activity areas: quiet, active, art, books, etc.

VI. Macro-teaching technics which may foster Cognitive Development

1. Individuation
2. Follow-through in cognitive learning: preparation, teaching, repetition, and recall
3. Enrichment - diversity of experience
4. Encouragement of child to assume responsibility in choice of tasks and play

D. The Interaction of Intelligence and Behavior as One Predictor of Early School Achievement in Working Class and Culturally Disadvantaged Head Start Children

Principal Investigators: Robert D. Hess and Virginia C. Shipman
Project Director: Ethel Hull

1. Problem

Intelligence test scores, though impressive in the degree to which they alone predict academic achievement as compared with the predictive power of other single variables (Hinkleman, 1955; Kennedy, Van De Riet, & White, 1963; Knief & Stroud, 1959), gain increased and significant predictive power when observed in interaction with other relevant variables. Torney, Hull, and Hess (1967), for example, using the same research population on which this study is based, found significant increases in multiple correlations when Stanford-Binet I.Q. scores were paired with teacher ratings of probable school achievement and adaptation in predicting scores on the Metropolitan Reading Readiness Test for a lower class Head Start population. Terman and Oden's (1947) followup on their original sample of gifted children illustrated the importance of socio-economic factors on later success, and numerous studies on over- and underachievement and on achievement motivation have added weight to the position that ability alone does not insure academic success (Lavin, 1965; Rosen, 1956; Thorndike, 1963).

This study seeks to determine the degree to which certain behavioral measures interact with intelligence, whether in a linear or curvilinear fashion, to help one predict academic achievement in Head Start children to a greater degree than would be possible were intelligence test performance alone used as the predictor variable.

The possibility of curvilinear rather than linear interactions has been suggested by Lavin (1965) and McClelland (1958). These investigators have hypothesized that there may be factors operating in a curvilinear fashion which, when considered together with ability level, may aid in the prediction of academic performance; Lavin suggests that these variables may be behavioral or motivational dispositions.

If the influence is a linear one, it is hypothesized that level of behavioral adjustment should have little effect on performance on achievement tests in a group of children with high intelligence test scores, but should have significant effects on the performance of children with low intelligence test scores. One might say that a child who has a level of intelligence below a certain threshold can only succeed academically if his motivation level is high; he has to want to succeed and must work harder than a bright child to keep up with the level of the class. If this child has behavioral problems, he cannot do well, whereas a brighter child can, for example, not pay attention in class and still do well because of the ability factor.

If the influence proves to operate a curvilinear fashion, then within either the high or the low I.Q. groups, a median level of behavioral adjustment should be predictive of optimal performance within that I.Q. group, whereas the extremes in behavior level should not. Again, differences in behavioral level within the low I.Q. group are expected to be greater and more often significant than those within the high I.Q. group, though perhaps to a lesser degree than with the linear model.

2. Method

Each of the hypotheses described above has been tested on two groups of Head Start children. One group was composed entirely of children from lower class homes. This group was divided by median split into high or low Stanford-Binet intelligence levels. Within each I.Q. level, further subdivisions were made; using a three-way split, children were categorized as having high, medium, or low levels on each of four Behavior Inventory Summary Areas (Aggression, Verbal-Social Participation, Independence, and Achievement-Oriented Behavior). Then, for each of these subgroups considered separately, performance on a number of achievement tests was examined, and, within each I.Q. group, differences in achievement across the behavior levels for each summary area were tested for significant interactions.

The second group of subjects differed from the first primarily in that a number of high I.Q., middle class children enrolled in the Head Start program were included in the original sample. Here, when dividing subjects into high or low I.Q. groups, median splits were not made, but rather approximately one standard deviation above national intelligence test norms was used as the baseline or starting point for the high I.Q. group, and approximately one standard deviation below national intelligence test norms was used as the baseline for the low I.Q. group. It was deemed necessary to test the original hypothesis on this second group of children because of the lack of comparability in range of intelligence test scores between the lower class group and national norms. The exact procedure followed in testing these hypotheses is described below.

a. Description of the Research Population

The data reported here come primarily from one of four Head Start centers evaluated in the summer and fall of 1965. Children from one center (Center A) participated in a followup testing program during part of their first year in school, following their summer Head Start experience; it is this group of children with which this study is primarily concerned. As certain analyses were conducted using data from two of the centers (Centers A and B), however, some data for Center A alone is not available. Whenever possible, data gathered only from Center A will be presented.

Center A served a population of 126 Negro and 26 white children who lived in a predominantly middle to upper middle class suburb of Chicago. The large majority of the children enrolled in the program were working class, however. The program was held in an elementary school building which had a full range of nursery and kindergarten equipment. Each class of fifteen was staffed by a teacher and an assistant teacher and two or three volunteers. The teaching staff were all professional nursery school, kindergarten, or first grade teachers. They had a mean of 9.5 years of teaching experience, and all but one of the ten had had more than one year of teaching experience. Volunteers were housewives from the community (some with teaching experience) and high school students, also from the community.

Center B served a population of 104 Negro children from a central city slum area in Chicago. The program was housed in a small four room "community house" adjacent to a church. There was a minimum of play equipment. The playground consisted of a grassy lot with two trees for climbing. In Center B there were two teachers for each group of thirteen and an occasional teen-age volunteer. The teachers here had had a mean of 3.5 years of teaching experience; fewer of them had taught nursery school or kindergarten children. A larger percentage of them had had previous experience with disadvantaged children, however.

In addition to the testing of children during the Head Start program, a selection of instruments used in the summer were readministered to a sub-group in the kindergarten classrooms in which the children were enrolled in the fall. This fall retest took place only in Center A where the concentration of post-Head Start children in three schools as well as the cooperation of school officials made a followup study practical. The scores on a nationally standardized test of reading and number readiness given in the spring, as well as the child's grade from his fall semester report card were also gathered from the school records.

Although Head Start is intended to be primarily for children from backgrounds of low social status, in each center there were a proportion of children who were from middle class, not working class homes. The majority of analysis in this study includes the children from working class backgrounds. This included children from homes where the head of the household was a laborer, domestic servant, skilled or semi-skilled manual worker or service worker. It also included those where the family receives public assistance.

b. Instruments Used in the Study

1) Measures of Cognitive Ability

A primary goal of the research project on which this study is based was to recommend a set of instruments for use with working class children which could be used to predict their subsequent school achievement, to evaluate school readiness, and to assess areas of special disability. A variety of cognitive assessments were employed, including some standardized tests, some instruments pilot-tested by other investigators, and other tests developed especially for the project.

Described below are only those instruments having greatest relevance to this study; for a description of all instruments used in the original project, see Hess, Kramer, Slaughter, Torney, Berry, and Hull (1966).

The intelligence of an elementary school child, particularly as measured by the Stanford-Binet, has been the single most widely used assessment of intellectual ability (Stott & Ball, 1965; Sundberg, 1960). The Stanford-Binet, Form L-M, was administered by trained testers once during the summer period. The mean I.Q. of the total group of working class Head Start children tested was 90.78, with a standard deviation of 14.51 (N = 187, Center A and B); for Center A alone the median I.Q. was 89. The stanford-Binet was significantly correlated (P = .02 or better) with every other cognitive test. Its highest correlation was with the Preschool Inventory administered in the summer ($\underline{r}$ = .79; N = 106).

The Preschool Inventory was designed by Caldwell (1965) specifically for Head Start. In this test, the child is asked his name, address, and the names of his classmates. His grasp of concepts of color, time, and ordination is tested as is his ability to follow instructions. The entire set of 152 items (preliminary form) was administered to the Head Start group in both Centers A and B during the third week of the program. As a result of complaints by teachers and testers that the Preschool Inventory was too bulky an instrument to be administered effectively, or to sustain the child's attention, it was decided to shorten the instrument for the retest program planned for the fall (at this time the revision of items subsequently prepared by Caldwell and Soule, 1966, was not available).

The percentage of children who had passed an item was the major piece of information used to select items. It was decided in the Partial Item Set items from all sections of the original instrument where the initial percentage of children passing was low enough to allow for future change, as well as a number of high-percentage-pass items so that less achieving children would not be discouraged by a series, none of which they could answer. Forty-nine items were included in the revised instrument, and were administered in the fall retesting. In order to obtain comparable scores for summer and fall testing, a score was given the child based on the Partial Item Set of 49 as he had answered them during the summer. The correlation of this Partial Item Set (summer), scoring only 49 items, with the Total Summer Score, scoring all 152 items, was .95. A part-whole correlation of this magnitude suggests that the results reported here with this set of items are probably highly similar to those of other investigators who use the revised Preschool Inventory items recently copyrighted by Caldwell and Soule (1966).

The correlation between the summer and fall testing using the Partial Item Set was .80. Information and achievement at the preschool level are highly consistent even across a four month period.

From the correlation of both administrations of the Preschool Inventory with the Binet (.79 and .68) it appears that the distinction in test content between achievement and intelligence tests is not clear-cut. The Binet in fact uses a large number of information questions in assessing intelligence and is probably more precisely referred to as generalized achievement test. The Preschool Inventory scores are significantly correlated with chronological age, as would be expected for a test which is not normed to give an I.Q. score.

2) Behavioral Measures

Cooperativeness with other children, the ability to talk about one's experiences, interest in listening to others, the ability to play without constant adult supervision, and energetic interest in new objects and experiences are among the social and emotional characteristics which foster adjustment and achievement in the early elementary school years. This study of Head Start attempted to assess these social and emotional characteristics by these types of rating instruments administered to testers, teachers and observers during the summer program, and to teachers and testers during the fall retest program. The three rating instruments were the Behavior Inventory, the Readiness Checklist, and the Fact Sheet of the Stanford Binet Intelligence Scale, Form L-M. The Behavior Inventory was designed by Dr. Edward Zigler for the Office of Economic Opportunity to be used on a nation-wide basis; the Readiness Checklist was designed at the Urban Child Center. As results of analysis of the Face Sheet of the Stanford Binet are not included in this report, a description of analysis concerning this instrument can be found in Hess, et. al. (1966).

The Readiness Checklist in its original form consisted of twelve items oriented toward readiness for and future progress in school. Children were rated by teachers, at the conclusion of the summer Head Start program, on perceived Readiness for Kindergarten. This rating was made on a five-point scale.

Two additional ratings (here on a seven-point scale) were then made by both teachers and observers for each child's probable Adaptation and Achievement during the early school years. Administration to both teachers and observers included children from Centers A and B. All items from this instrument were included in the fall retest sample of children from Center A.

When one examines inter-rater reliability, product moment correlations based only on working class children from Center A between teacher and observer ratings of Probable School Achievement and Adaptation were moderate though significant at better than the .01 level ($\underline{r}$ = .484, N = 86 for teacher vs. observer Achievement ratings; $\underline{r}$ = .535, N = 89 for teacher vs. observer Adaptation ratings).

The Behavior Inventory, originally a fifty-item instrument, was designed to measure certain behavioral and emotional tendencies ranging from verbal participation, social interaction and aggression to general dispositional states. Each child was rated for each item on a seven-point scale; numerically low ratings indicate similarity to or possession of the attribute in question, numerically high ratings indicate dissimilarity. The original instrument was administered four times, once to teachers and once to observers at the onset of the Head Start program, and again to both teachers and observers during the eighth week of the program. The teachers' and observers' initial administrations and the teachers' second administration of the instrument included children from Centers A and B; the second observers' administration included a partial sample of children from Center A only. During the retest program, a condensed version of the instrument was administered to teachers in Center A.

As the original Behavior Inventory as sent out by the Office of Economic Opportunity required that items be rated on a four-point scale, 136 protocols of this version of the instrument were administered to teachers at the onset and at the conclusion of the summer program. As the research staff felt that this scale did not allow for sufficient discrimination, a seven-point rating was constructed and was applied to every child who was rated. The correlations between the application of the four-point and the seven-point scales to the same child for the same administration ranged from .70 to .94 (N ranged from 132 to 136), for the fifty scales used in the total Behavior Inventory. The items as rated on the seven-point scale were used in all reported analysis because the most extensive data had been collected using this item format. Although it is impossible to determine what results would have been obtained if the four-point scale had been used, it is likely that the results would have been highly similar to those reported here.

As many of the instruments administered during the summer Head Start program were lengthy and difficult to administer efficiently, instrument reduction was both necessary and desirable. On the basis of preliminary factor analyses of the fifty-item Behavior Inventory, twenty-three items were chosen for followup testing during the autumn following the Head Start summer. The major criterion for including an item in the retest was its high loading on one of the rotated factors.

3

A more complete factor analysis including all observations (N = 769) made by teachers and observers during the summer testings in both centers was conducted using only these twenty-three selected items, for the purpose of determining summary areas to compute subscores and reduce the number of items for analysis. Six factors were extracted using a Principal Component Analysis. For the first five factors, the four items with the highest loadings were selected and ratings were averaged to form five summary scores: Aggression, Verbal-Social Participation, Timidity, Independence, and Achievement-Oriented Behavior[1].

As summary scores based on Center A working class children (initial summer ratings by teachers) were to be used as the major behavioral criteria for this study, a factor analysis of these data alone was performed to insure and confirm the stability of the factors found for the entire sample. In this analysis, no Timidity factor was obtained, although the remaining four factors were either highly similar to or identical with those extracted from the total sample analysis.

Only the four summary scores, Aggression, Verbal-Social Participation, Independence, and Achievement-Oriented Behavior, which emerged as factors both for the total sample analysis and for Center A analysis were used in this study.

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1. These suggested summary scores are not factor scores in the true sense because items included were not weighted by their loadings on the factor (although the item which was loaded negatively on the third factor was reversed in scoring).

Inter-rater reliability (teachers' vs. observers' initial administrations) was high to moderately low, although all correlations were significant at $p = .01$ or better. Inter-rater reliability was highest for the summary areas of Aggression (r = .637, N = 116) and Verbal-Social Participation (r = .657, N = 118), but was low for the areas of Independence (r = .308, N = 118) and Achievement-Oriented Behavior (r = .413, N = 116). It is evident from the above that some item clusters are more reliable in this respect than others. The less reliable clusters may reflect a certain ambiguity in the working of the "independent" or "achieving" behaviors. In measuring autonomous achievement strivings in nursery school children as rated by different teachers at different points in time, Beller (1957) obtained correlations ranging from .67 to .80 with an N of 52. Also, Crandall and Sinkeldam (1964) obtained inter-rater reliability coefficients ranging from .71 to .88 (N = 24) on items measuring achieving behaviors in a sample of school-age children ranging in age from just under seven to twelve and one-half years. The higher correlations found in these studies possibly support the hypothesis that items in the Behavior Inventory Summary Score of Achievement-Oriented Behavior are to some extent ambiguous and in need of clarification.

Other investigators, however, have also found lower inter-rater reliability correlation coefficients for items measuring independence than for items measuring other, more clearly defined behaviors, suggesting that independence presents a general problem in measurement. Emmerich (1966), for example, obtained inter-rater reliability coefficients ranging from .51 to .63 (N = 53) on measures of aggressive behavior in nursery school children, while his reliability coefficients for items measuring independent behavior in the sample ranged from .43 to .47.

Product-moment correlations of Behavior Inventory Summary Scores (Teachers, first administration) with each other ranged widely in magnitude. Achievement-Oriented Behavior was the only summary score showing significant interactions with every other summary area (r ranged from .39 to .52); Verbal-Social Participation, though interacting significantly with Achievement (r = .48), showed approximately zero with either Aggression or independence. Aggression interacted significantly and negatively with independence and Achievement (N = -.42 and -.39, respectively), but had an approximately zero correlation with Verbal-Social Participation.

These interaction patterns suggest that, while Achievement-Oriented Behavior relates to each of the remaining three Behavior Inventory summary areas, it does so in different ways, as level of either Aggression, Verbal-Social Participation or Independence is in only one case (Aggression vs. Independence) predictive of performance on summary areas other than Achievement. The major area of overlap, then, among the four summary areas is seen in the relationship of Achievement-Oriented Behavior to the three remaining summary areas and generally not within the three remaining areas themselves. The summary areas of Aggression, Verbal-Social Participation and Independence are, in this study, relatively independent of each other and appear to tap relatively distinct areas of behavior.

Of the four Behavior Inventory Summary Scores, product-moment correlations indicate that Aggression is the one behavior area showing little interaction with cognitive measures (See Table 1). Verbal-Social Participation, Independence, and Achievement-Oriented Behavior interacted significantly though moderately with the Stanford Binet, the Draw-A-Man, and both initial and retest administrations of the Preschool Inventory, Partial Set.

Although three of the four behavioral correlations (Teachers' initial administration of the Behavior Inventory) with Stanford Binet I.Q. were statistically significant, the highest proportion of variance accounted for in any one of these correlations was .10. It is felt, therefore, that while Behavior Inventory Summary Scores are to some extent confounded with intelligence test scores, this effect is too small to present major problems in testing the central hypothesis examined in this study.

TABLE 1
RELATIONSHIPS BETWEEN BEHAVIOR INVENTORY SUMMARY SCORES AND COGNITIVE MEASURES+

BEHAVIOR INVENTORY SUM. SCORES	STANFORD-BINET IQ (FORM LM)	D-A-M WK 4	PRESCHOOL INVENTORY PARTIAL SET	
			PRETEST	RETEST
Aggression	-.134 (116)	-.057 (118)	-.279** (108)	-.197 (90)
Verbal-Social Participation	.310** (117)	.250* (118)	.349** (108)	.360** (90)
Independence	.222 (117)	.192 (119)	.372** (108)	.337** (90)
Achievement-Oriented Behavior	.269** (115)	.272** (117)	.474** (106)	.518** (88)

+Correlations based on teachers' ratings of working class Center A children only. D-A-M = Draw-A-Man I.Q.
*p = ≤ .05; ** p = ≤ .01.
a.Signs have been changed in a number of correlations in this table so that high scores indicate a high amount of the quality named.

3) Measures of School Achievement

The major criteria for assessing the child's success in kindergarten were scores on the Metropolitan Test of Reading and Number Readiness, scaled into percentiles, and the children's grades on report cards at the end of the fall semester. All of these tests and assessments were conducted as part of the school system's regular program; these were not ratings made for research purposes, but rather were ratings of children's progress which the teachers sent home to parents and made a permanent part of the school record. The report cards used by this school system are similar to those used to report progress in kindergarten and the early grades in many school systems, including not only progress in achievement tasks, but also various types of social cooperation, discipline, and responsibility that are important in the kindergarten classroom.

Because there were twenty-seven separate ratings, each on a three-point scale, on these report cards, the data were factor analyzed to suggest item combinations which could be used to reduce the number of separate criteria of school success. A Principal Component Analysis with Varimax Rotation of these items was conducted using the population of 84 Head Start children from Center A. Six factors were extracted. Five of these clusters of items were used as the basis for scoring Summary Scores. The first included four items, such as "recognizes numerals", and "interprets the meaning of pictures" and is called the Performance of School Tasks. These are ratings which the report card grouped under Number and Reading Readiness. The second factor includes four items which we called Social Conformity; it includes items such as "respects the rights, opinions, and property of others" and "is kind, polite and thoughtful", ratings which the report card grouped under Social and Emotional Growth. The third score includes five items such as "has good self control" and "accepts and carries out responsibility". This we called the Responsibility score. The fourth score was called Verbal Assertion and Participation, and included five items; e.g., "contributes to discussion and planning" and "is curious about the world around him". The fifth score included five items, e.g., "experiments with creative material" and "plans and works independently"; this was called the Independence score.[2] Although the item selection was based upon a factor analysis, these scores are not factor scores. Each Summary Score was the mean of the ratings for the items with the highest loadings on the factor. These items were not weighted according to their factor loadings.

3. Results

a. Single Predictors of School Achievement from Information Gathered During Summer Head Start

The correlation of the Metropolitan Reading Readiness standardized test with Teachers' Report Card rating of Performance of School Tasks was .803. Because of this high correlation of the two criteria, they are grouped in the following analysis. In considering the Report Card Summary Scores, it is important to note that these scores were all correlated significantly with each other. This is one disadvantage of using simple summed scores, not factor scores (which by design are independent of each other). The one Report Card Summary Score which was not highly correlated with the others was Social Conformity. Since there is such a high degree of commonality among our criteria, this discussion will be divided into three parts: Prediction of Reading Readiness Standardized Test Score and prediction of Report Card Summary Area of Performance on School Tasks; Prediction of Socially Conforming behavior; Prediction of Responsibility, Verbal Assertion, and Independence. Table 2 in the Appendix summarizes the statistical findings.

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[2] One additional report card summary score was computed for items dealing with Health. Results of analysis with this score are included in Hess, et al. (1966).

1) Predicting Reading Readiness

The best predictors of success in the academic tasks in kindergarten, measured either by score on the Reading Readiness test or by teachers' ratings of the Performance of School Tasks, was the Preschool Inventory (initial summer administration, Partial Set Score), with correlations of .69 and .75 respectively, and the Stanford Binet, with correlations of .68 and .69. Draw-A-Man I.Q. was correlated significantly with the two measures of school success, but at a considerable lower level ($\underline{r}$ = .40 in both cases).

The second-best predictors of this type of school achievement were specific ratings by either Head Start teachers or observers of how well the child would probably achieve or adapt in kindergarten. These correlations were all significant and ranged from .39 to .61. There was no consistent tendency for either teachers or observers to be consistently superior in making this type of prediction. These items all came from items in instruments such as the Behavior Inventory in being directly oriented to prediction of school success.

The third group of variables which predicted Reading Readiness and the Report Card Summary Area of Performance of School Tasks were the Summary Scores from the Behavior Inventory, administered to both teachers and observers. When these scores were used as single predictors, the correlations for teachers were about equal to or slightly better than those for observers. The correlations with school achievement were highest for the Summary Area of Achievement-Oriented Behavior and lowest for the Summary Areas of Aggression and Independence.

Because teachers were asked to make these ratings on all children both in the first few weeks of Head Start and again at the end of the program, it was possible to compare the accuracy of prediction of school success at these two periods. The correlations for a given Summary Score with School Performance for Time 1 and Time 2 were almost identical. In only one case was a correlation significant at a later time period and insignificant at the earlier time. This suggests that teachers do not need to have extensive experience with children in Head Start in order to make moderately accurate predictions of their success in kindergarten; more precisely, additional weeks of experience do not appear to significantly improve their ability to predict achievement.

In summary, the best predictors of kindergarten task-achievement for this sample were some measures of the child's intelligence or achievement and the ratings by his Head Start teacher or observer of how well they expected him to achieve or adapt in kindergarten.

2) Prediction of Socially Conforming Behavior

This variable is handled separately from the remainder because it has substantially lower correlations with other Report Card Summary Scores and lower correlations with predictor variables as well. Its best predictor ($\underline{r} = .36$) was the Probable Adaptation rating made by teachers. Its next best predictors were the Stanford-Binet I.Q. ($\underline{r}$ = .34), the Preschool Inventory ($\underline{r}$ = .32), Behavior Inventory ratings by both teachers and observers on Aggression and Achievement-Oriented Behavior, and the remaining teacher and observer ratings on Probable School Adaptation and Achievement. Other variables showed similar patterns of prediction to those reported in the previous section, but all the correlations were appreciably lower. This is apparently a characteristic which is difficult to predict from observation during a summer Head Start program.

3) Prediction of Report Card Summary Scores on Responsibility, Verbal Assertion, and Independence

For these variables also, the best predictors were the cognitive tests of intelligence and achievement. Correlations with the Stanford-Binet and Preschool Inventory ranged from .51 to .71. The Draw-A-Man I.Q. was predictive here at a slightly higher level than was the case in previous sections.

Moving to the teachers and observers, ratings of Adaptation and Achievement were significant predictors (correlations ranged from .31 to .58), with some sizeable correlations between Behavior Inventory Summary Scores and these less academic types of kindergarten success. Aggression, rated by Head Start teachers and observers, showed moderately high negative correlations with the Responsibility Summary Score, while the Report Card Score on Verbal Assertion could be predicted with some accuracy by Head Start Behavior Inventory ratings of high Verbal-Social Participation and high Achievement-Oriented Behavior.

b. Interaction of Behavior and Intelligence in the Prediction of Academic Achievement

As briefly described in the Introduction to this report, the hypotheses under consideration involved the extent to which each of four Behavior Inventory Summary Areas interacted with intelligence, whether in a linear or curvilinear fashion, to aid in the prediction of academic achievement to a greater degree than would the use of intelligence test performance alone.

When the question of possible contributions by behavior areas to the prediction of academic achievement was first considered, it was decided to obtain multiple regression coefficients on these four variables in interaction with intelligence, using as dependent variables scores on the Metropolitan Reading Readiness Test and the four Report Card Summary Areas that then seemed to be the most useful ones (i.e., Performance on School Tasks, Responsibility, Verbal Assertion, and Independence). Results obtained proved inconclusive; for only two of the four Behavior Inventory Summary Scores did multiple correlations represent significant increments over the simple correlations (see Table 3).

The Binet, as has been shown, is highly correlated with Reading Readiness, Performance on School Tasks, Verbal Assertion, Responsibility, and Independence, with correlations ranging from .55 to .72. Multiple correlations using one Behavior Inventory Summary Score (Aggression), in addition to the intellective variable, significantly raised the predictability of the Report Card Summary Area of Responsibility, and the Behavior Inventory Summary Score of Verbal-Social Participation, in addition to the I.Q. score significantly raised the predictability of the Report Card Summary Score of Verbal Assertion. In no other case did Behavior Inventory Summary Scores add significantly to the predictive power of the Stanford-Binet.

Table 3

Predicting Five Criteria of Success in Kindergarten using Stanford-Binet I.Q. Scores and Behavior Inventory Ratings by Head Start Teachers

Criteria Predicted	Simple Correlations		Multiple Correlations			
	N	Binet I.Q.	Binet/ Agg.	Binet/ Agg./verb.	Binet/Agg./ verb./Ind.	Binet/Agg. verb./Ind./Ach.
Reading Readiness	81	.724	.732	.735	.738	.738
School Performance	55	.726	.727	.728	.732	.734
Verbal Assertion	55	.717	.719	.746*[a]	.762*[a]	.762
Responsibility	55	.549	.611*[b]	.614*[b]	.619*	---
Independence	55	.671	.674	.675	.699	.700

* indicates an increase in the multiple correlation, significant at $p < .05$.

Predictor Variables are: Stanford-Binet I.Q., Form L-M; Behavior Inventory Ratings on Aggression, Verbal-Social Participation, Independence, and Achievement-Oriented Behavior.

Criteria of Success are: Percentile Score on the Metropolitan Test of Reading and Number Readiness; Report Card Summary Scores on School Performance, Verbal Assertion, Responsibility, and Independence.

[a] Significant contribution made only by the addition of the Behavior Inventory Summary Score of Verbal-Social Participation; other Behavior Inventory Summary Scores did not contribute significantly.

[b] Significant contribution made only by the addition of the Behavior Inventory Summary Score of Aggression; other Behavior Inventory Summary Scores did not contribute significantly.

It was then decided to divide the sample into high and low intelligence groups and to compare, within each group, the differences in predictability of achievement variables across levels of behavior for each of the four Behavior Inventory Summary Scores, looking for either linear or curvilinear interactions. As stated earlier, if the interaction is a linear one and if our hypothesis is correct, then level of behavior adjustment should have little effect on performance on achievement tests in a group of high I.Q. children, but should have significant effects on the performance of low I.Q. children, due to the ability factor operating in the case of the high I.Q. child. If the interaction is a curvilinear one, then within either the high or the low intelligence groups, a median level of behavioral adjustment should be predictive of optimal performance within that I.Q. group, whereas the extremes in behavior level should not.

Each of the hypotheses described above has been tested on two groups of Head Start children. One group (N = 117) was composed entirely of Center A children from lower-class homes. This group was divided by median split into high or low Stanford-Binet Intelligence levels. Within each I.Q. level, further subdivisions were made; using a three-way split, children were categorized as having high, moderate or low levels on each of the four Behavior Inventory Summary Scores.

The second group of children (N = 69) differed from the first primarily in that a number of high I.Q., middle-class children enrolled in the Head Start program were included in the original sample. Here, when dividing subjects into high or low I.Q. groups, median splits were not made, but rather approximately one standard deviation above national intelligence test norms was used as the baseline or starting point for the high I.Q. group. Whereas with the first group of children, high I.Q. began with Binet scores of 90, for the second group it began at 110. For the first group, low I.Q. began at 89; for the second group it began at 87. It was deemed necessary to test the original hypothesis on this second group of children because of the relative absence of truly high I.Q. children in the lower-class group and because of the lack of comparability in range of intelligence test scores between the lower-class group and national norms. Table 4 presents both the number of subjects involved in each behavior level within each I.Q. group as well as the range of scores which each subgroup encompasses.

Finally, for each of these subgroups considered separately, performance on a number of achievement tests and ratings was examined, and, within each I.Q. group, differences in achievement across the behavior levels for each Summary Area were tested for significant interactions. The achievement tests and ratings used in this analysis were: Percentile Score on the Metropolitan Test of Reading and Number Readiness; the five Report Card Summary Scores on School Performance, Verbal Assertion, Responsibility, Independence, and Social Conformity; the three Readiness Checklist items of Kindergarten Readiness, Adaptation, and Achievement, administered to teachers during the fall retest program; and the Preschool Inventory Retest Score, Partial Item Set.

It can be seen from Table 4 that, especially for Sample II, sizes of behavior subgroups within any one I.Q. level were in most cases not of comparable magnitude. Also, when performance on variables chosen as criteria of success is included in these interactions, the

TABLE 4

Composition and Range of Intelligence and Behavior Level Subgroups Constructed for the Prediction of Academic Achievement

Predictor Variable Subgroups	Range of Summary Scores Included in Level	High I.Q. (Binets of 90+*) Sample I N	Low I.Q. (Binets of 89-) Sample I N	High I.Q. (Binets of 110+) Sample II N	Low I.Q. (Binets of 87-) Sample II N
Aggression:					
High	4.0-	22	18	5	13
Medium	3.9-6.1	24	22	7	14
Low	6.2+	15	15	16	14
Verbal-Social Participation:					
High	3.7-	24	14	15	8
Medium	3.8-5.4	23	19	10	16
Low	5.5+	15	22	4	17
Independence:					
High	3.2-	21	13	18	10
Medium	3.3-4.6	26	16	7	10
Low	4.7+	15	26	4	21
Achievement-Oriented Beh.:					
High	5.7+	21	7	18	3
Medium	4.6-5.6	29	25	8	20
Low	4.5-	11	22	3	17

*In this table, plus signs following a number indicate that the subgroup is composed of children with scores at and above the number indicated; minus signs following a number indicate that the subgroup is composed of children with scores at and under the number indicated.

number of subjects is in some cases further diminished due to missing information. Due both to inequality of cell size and to missing information, multivariate analyses of variance, which would have been the most appropriate and desirable tests of significance available, could not be performed.

It was, then, found necessary to measure significance of interactions through the use of t-tests. This, unfortunately, presented new problems due to the interest in looking for either linearity or curvilinearity, as only a limited number of t-tests can be performed in an anlaysis such as this. It was decided to first obtain univariate statistics on the data and then, for each criterion of success in interaction with each of the Behavior Inventory Summary Scores within one I.Q. level, to determine which trend was actually present in the data. In other words, if the success criterion of Reading Readiness was seen to interact in a linear fashion for the high I.Q. group in the subdivisions of level of Aggression, a t-test between the high and low levels was performed. If, on the other hand, a curvilinear trend was apparent, t-tests between the middle and the extreme levels were performed.

It should be mentioned at this point that, in defining linearity in the data, an interaction has been called linear either when a definite linear progression was present or when means in two adjacent cells or in all three cells were equal ($\bar{A}$ $\bar{B}$ $\bar{C}$). An interaction has been called curvilinear when the direction of movement of the first and third means was the same, with the second mean showing directional deviation ($\bar{A}$ $\bar{B}$ $\bar{C}$, or vice versa).

Often these curvilinear deviations were extremely small and did not approach significance; often, too, cell sizes were too small to allow one to place any great faith in the interactions to which they contributed. This was especially the case with much of the Sample II data, where high I.Q./negative behavior (for example, high I.Q./high Aggression) cells contained only two or three subjects. As large numbers of high I.Q. children have not been available in this study, many of these interactions can only be interpreted as suggestive. Even so, they are highly interesting and will in the future be studied intensively when a more adequate sample can be obtained.

Our initial hypothesis, that differences in behavior level would affect success criteria scores in low I.Q. children more than it would in high I.Q. children, was generally not supported. See Tables 5-8 in the Appendix for information regarding direction and significance of I.Q./Behavior interactions in the prediction of academic achievement.

Looking at those success criteria which either objectively measure achievement (Preschool Inventory Retest scores and Metropolitan Reading Readiness scores) or are ratings of achievement as demonstrated during part of the first year of school (the Readiness Checklist item of Achievement), it is apparent that for the Behavior Inventory Summay Areas of Aggression and Independence, performance of high I.Q. children tended to be significantly handicapped by high levels of Aggression and by low levels of Independence, while scores of low I.Q. children showed little interaction in these behavior areas.

For the Behavior Inventory Summary Areas of Verbal-Social Participation and Achievement-Oriented Behavior, however, some change in interaction patterns was seen. For the Preschool Inventory, where high levels of Verbal and Achieving behaviors were significantly associated with success in low I.Q. groups, no significant interactions for high I.Q. children appeared. For the success criterion of Reading Readiness, high levels of Verbal behavior significantly influenced scores of high I.Q. children but not those of the low I.Q. groups. Level of Achieving behavior here did not significantly interact with success on Reading Readiness for either I.Q. group.

High ratings of Verbal and Achieving behaviors, observed in interaction with the Readiness Checklist item of Achievement, tended to be significantly associated with success in the high I.Q. groups, but not in the low I.Q. groups.

With the exception, then, of Preschool Inventory Retest scores, which interacted significantly with level of Achieving and Verbal behaviors in low I.Q. groups, it appears that the achievement performance of high I.Q. children suffers more from detrimental behavior patterns than does the performance of their low I.Q. peers, or, rather, that optimal behaviors in low I.Q. children do little to overcome the handicap of low measured intelligence.

Looking now at the Report Card Summary Areas, it should be noted that four of these five success criteria tended largely to provide measures of behavior patterns which are generally felt to play important roles in adjustment to the school environment. Performance of School Tasks, the exception here, is composed of items oriented to actual school achievement.

Success in Performance on School Tasks tended to be associated with high Verbal and Achieving behaviors for high I.Q. children, and with high independent behaviors for the low I.Q. groups. Level of Aggression showed no significant interactions, and did not seem to interact more with either of the two I.Q. levels.

High Social Conformity, associated with low Aggression, low or moderate Independence, and high Achievement-Oriented Behaviors, interacted little with level of Verbal-Social Participation. Only one significant _t_-test was obtained for this variable, indicating a significant interaction between Achievement-Oriented Behavior and Social Conformity in the high I.Q. group.

Level of Aggression significantly interacted with Responsibility in low I.Q. groups, but showed no interaction for the high I.Q. groups. Neither Verbal-Social Participation nor Independent behavior interacted significantly with Responsibility, though level of Achievement-Orientation interacted significantly with Responsibility in the high I.Q. groups.

The Report Card Summary Area of Verbal Assertion interacted significantly with level of Independence and Achievement-Orientation for the low I.Q. groups, but not for the high I.Q. samples. It was not significantly associated with level of Aggression or Verbal-Social Participation for either group, though there was a tendency for level of Aggression to affect Verbal Assertion scores more strongly in the low I.Q. children, and for level of Verbal-Social Participation to affect Verbal Assertion scores more in the high I.Q. samples.

The Report Card Summary Area of Independence interacted significantly with Behavior Inventory Summary Areas of Aggression, Independence, and Achievement-Oriented Behavior in the low I.Q. groups, though not in the high I.Q. samples, and showed significant interaction with level of Verbal-Social Participation in the high I.Q. groups.

To summarize the Report Card Summary Areas of Social Conformity, Responsibility, Verbal Assertion, and Independence, it seems that Social Conformity showed few differences in degree of interaction with Behavior Inventory Summary Areas between the two I.Q. groups. For Responsibility ratings, level of Aggression affected low I.Q. children more than high, and the reverse was true for the behavior area of Achievement-Oriented Behavior. Level of Independence and Achievement-Oriented Behavior was significantly associated with the Report Card Summary Area of Verbal Assertion in low I.Q. children, but Verbal Assertion did not significantly interact with Aggression or Verbal-Social Participation in either I.Q. group. Level of Aggression, Independence, and Achievement-Oriented Behavior interacted significantly with scores on the Report Card Summary Area of Independence for low I.Q. children, and level of Verbal-Social Participation was significantly associated with Independence for the high I.Q. group.

Although it was earlier seen that behavior levels did not significantly affect objectively measured achievement in low I.Q. groups, though significant differences in achievement scores between behavior levels in high I.Q. groups were apparent, these same behavior areas did tend to affect Report Card Summary Area ratings slightly more in low I.Q. groups than in high I.Q. ones, with a greater number of significant _t_-tests appearing for the low I.Q. groups. Behavior patterns in low I.Q. children, then, while they do not significantly affect level of achievement, can be instrumental in facilitating adjustment to the general school environment, as measured by teachers' ratings. The same, though to a less striking degree, holds true for high I.Q. children, though it must be kept in mind that there was a slight tendency for certain behavior areas to interact more strongly with performance in one I.Q. group that in the other. Aggression and Independence, for example, were behavior areas showing more interaction with Report Card Summary Areas for low I.Q. children than for high; level of Verbal-Social Participation tended to interact slightly more in high I.Q. groups than in low, and level of Achievement-Oriented Behavior interacted to an equal degree with both I.Q. samples.

The Readiness Checklist rating of Adaptation showed little difference in interaction pattern between the two I.Q. groups; high Adaptation was significantly related to low Aggression, high Independence, and high Achievement-Oriented Behavior. It did not interact significantly with level of Verbal-Social Participation, though there was a tendency for low I.Q. levels to interact more than high levels.

The Readiness Checklist rating of Kindergarten Readiness did not interact significantly with Aggression, but did interact significantly with level of Verbal-Social Participation for both I.Q. groups, and with level of independence for the high I.Q. groups. The Kindergarten Readiness rating interacted significantly with the Behavior Inventory Summary Area of Achievement-Oriented Behavior for the low I.Q. groups, though not for the high I.Q. ones.

Turning now to the question of linearity versus curvilinearity, it should be mentioned that no striking curvilinear trends were in evidence, and that no significant $\underline{t}$-scores would have been obtained had means for the extreme levels been combined and tested for significance against means of moderate level groups. In most cases where slight curvilinear trends appeared, the greatest magnitude of difference occurred between the moderate and either one of the two extremes in behavior level, with only minor differences between the moderate and the alternate extreme level. Some pattern in linear or curvilinear tendency was observed, however, for some of the variables. All success criteria (with the exception of one cell) behaved in a linear fashion when observed in interaction with Achievement-Oriented Behavior.

Preschool Inventory and Reading Readiness scores, and the Report Card Summary Area of School Tasks tended either to interact in an unmistakably linear fashion or else provided only weak evidence of curvilinearity.

The Report Card Summary Area of Social Conformity did show curvilinear interactions for the Behavior Inventory Summary Area of Independence, where moderate levels of Independence were consistently associated with highest Conformity ratings. These trends were not significant, but they were consistent.

The Report Card Summary Areas of Responsibility and Independence tended to interact in a linear fashion across all Behavior Inventory Summary Areas, a trend especially marked for the low I.Q. groups. Some evidence of curvilinearity was apparent for the high I.Q. groups, although here Sample II data is open to suspicion because of the lack of an appreciable sample of high I.Q., negative behavior area groups.

The remaining success criteria either showed linear interactions or gave only marginal evidence of curvilinearity. In these latter instances, magnitude of difference across behavior levels was seldom evenly distributed. Report Card Summary Areas tended to produce minor curvilinear trends for some Behavior Inventory Summary Areas more than did any of the other success criteria, and these trends were restricted largely to the high I.Q. samples, where adequacy of sample is in question.

4. Conclusions

In summary, the majority of success criteria appear to interact in a linear fashion across behavior areas, and what slight indications of curvilinearity do occur appear across high I.Q. groups on a number of the Report Card Summary Areas and across all I.Q. groups on Readiness Checklist items in interaction with the behavior areas of Aggression and Verbal-Social Participation. The majority of curvilinear trends, however, are trends lacking an even distribution of magnitude of difference across the behavior levels, and in most cases the greatest magnitude of difference occurs between moderate levels and one of the two extreme levels, with only minimal differences appearing between moderate behavior levels and the alternate extreme level.

For this Head Start sample, then, few conclusions can be drawn from the results of this study. While the results of the analyses are, with few exceptions, not entirely clear-cut, they are provocative in their implications. As indicated above, there is evidence that on tests or ratings which profess to objectively measure achievement, scores of high I.Q. children seem to be significantly more greatly affected by differences in level of Aggression, Verbal-Social Participation, Independence, and Achievement-Oriented Behavior than do scores of low I.Q. children. This suggests that handicaps in those performance areas assessed by intelligence tests cannot be effectively mediated through the adoption of optimal behavior patterns. But it has also been seen that behavior patterns of low I.Q. children appear to facilitate or impede general adjustment to the school environment, as measured by teachers' Report Card Ratings, more than do behavior patterns of high I.Q. children, especially in Behavior Inventory Summary Areas of Aggression and Independence. Optimal adjustment to the school environment in these low I.Q. children might eventually facilitate effective contact with the types of intellectual stimulation afforded by the school, and this in turn might, over time, lead to significantly greater achievement on objective tests. It is unfortunate that the follow-up program was limited to only the first half of the first year in school.

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APPENDIX TO RESEARCH REPORT D

ADDITIONAL TABLES

TABLE 2

Correlations of Selected Variables from Summer Head Start Testing with Six Criteria of Performance in Kindergarten+

	Summary Scores from Report Cards					
Summer Head Start Variables	Percentile score Met. Read/Num Readiness	Perform. School Task	Social Conform.	Verbal Assert.	Respon-sibility	Indepen-dence
Cognitive Variables						
Stanford-Binet IQ	.68** (97)	.69** (70)	.34** (81)	.67** (75)	.51** (79)	.58** (80)
Preschool Inventory (1, Partial Score)	.69** (89)	.75** (66)	.32** (76)	.71** (71)	.54** (74)	.59** (75)
D-A-M IQ (Wk 4)	.40** (98)	.40** (73)	.22* (84)	.54** (78)	.31** (82)	.36** (83)
Ratings by Head Start Teachers						
Prob. Adapt. Kgtn.	.51** (96)	.43** (71)	.36** (82)	.49** (76)	.46** (80)	.47** (81)
Prob. Achieve. Kgtn.	.54** (97)	.47** (69)	.31** (80)	.58** (74)	.41** (78)	.50** (79)
Beh. I.- Aggress. Time 1	-.27** (97)	-.16 (73)	-.33** (84)	-.15 (78)	-.39** (82)	-.28* (83)
Beh. I.- Aggress. Time 2	-.18 (98)	-.17 (73)	-.30** (84)	-.24* (78)	-.41** (82)	-.30** (83)
Beh. I. - Verb/ Soc. Time 1	.28** (98)	.26* (73)	.24* (84)	.41** (78)	.19 (82)	.15 (83)
Beh. I. - Verb/ Soc. Time 2	.28** (98)	.29** (73)	.26* (84)	.42** (78)	.26* (82)	.12 (83)
Beh. I. - Indep. Time 1	.28** (98)	.15 (73)	.05 (84)	.25* (78)	.16 (82)	.33** (83)
Beh. I. - Indep. Time 2	.29** (98)	.25* (73)	.14 (84)	.30** (78)	.27* (82)	.39** (83)

Table 2 - continued

	Summary Scores from Report Cards					
Summer Head Start Variables	Percentile score Met. Read/Num Readiness	Perform. School Task	Social Conform.	Verbal Assert.	Responsibility	Independence
Ratings by Head Start Teachers						
Beh. I. - Achieve. Time 1	.35** (96)	.36** (71)	.31** (82)	.48** (76)	.34** (80)	.35** (81)
Beh. I. - Achieve. Time 2	.34** (97)	.36** (72)	.26* (83)	.40** (77)	.37** (81)	.38** (82)
Ratings by Observers						
Prob. Adapt. Kgtn.	.39** (74)	.50** (56)	.28* (65)	.55** (60)	.31* (63)	.41** (64)
Prob. Achieve. Kgtn.	.47** (74)	.61** (56)	.32** (65)	.58** (60)	.37** (63)	.53** (64)
Beh. I. - Aggress. Time 1	-.09 (97)	-.22 (71)	-.19 (82)	-.17 (76)	-.43** (80)	-.22* (81)
Beh. I. - Verb/Soc. Time 1	.20* (97)	.33* (72)	.03 (83)	.29* (77)	.10 (81)	.04 (82)
Beh. I. - Indep. Time 1	.15 (97)	.12 (72)	.15 (83)	.17 (77)	.20 (81)	.24 (82)
Beh. I. - Achieve. Time 1	.27** (97)	.35** (72)	.30** (83)	.31** (77)	.29** (81)	.32** (74)

+Correlations based on Center A, working-class children only. Signs have been changed in this table so that high scores indicate a high amount of the quality named.

*p $\leq$.05; **p$\leq$.01

TABLE 5

The Interaction of the Behavior Summary Score of Aggression with IQ in the Prediction of Academic Achievement⁺

	Low IQ Group (Stanford-Binet, Form LM)									
	High Aggression			Medium Aggression			Low Aggression			
Success Criteria			high/medium			low/medium			high/low	Trend (L = Linear; C = Curvilinear)
	$\bar{X}$	N	t	$\bar{X}$	N	t	$\bar{X}$	N	t	
1. Caldwell Retest										
Sample I	27.50	14	-.066	27.63	16	-.654	26.45	11		C
Sample II	26.67	9	.203	26.20	10	.138	26.45	11	---	C
2. Reading Readiness										
Sample I	11.47	15	---	13.78	18	---	14.38	13	.921	L
Sample II	12.18	11	-.666	15.50	12	-.232	14.38	13	---	C
3. School Tasks										
Sample I	13.50	10	---	15.10	10	---	15.30	10	1.11	L
Sample II	13.87	8	-.937	15.75	8	-.226	15.30	10	--	C
4. Social Conformity										
Sample I	16.83	12	---	23.00	15	---	23.09	11	2.55*	L
Sample II	15.50	10	-3.43**	24.09	11	-.410	23.09	11	---	C
5. Responsibility										
Sample I	13.64	11	---	17.43	14	---	20.18	11	4.15**	L
Sample II	13.00	10	---	17.80	10	---	20.18	11	4.72**	L
6. Verbal Assertion										
Sample I	15.00	10	---	15.84	13	---	16.91	11	1.45	L
Sample II	14.44	9	---	16.00	10	---	16.91	11	1.93	L
7. Independence										
Sample I	15.27	11	---	18.27	15	---	19.27	11	1.97	L
Sample II	14.60	10	---	18.00	11	---	19.27	11	2.32*	L

Table 5 - continued

Success Criteria	Low IQ Group High Aggression $\bar{X}$	N	high/medium t	Medium Aggression $\bar{X}$	N	low/medium t	Low Aggression $\bar{X}$	N	high/low t	Trend (L = Linear; C = Curvilinear)
8. Kgtn. Readiness Retest										
Sample I	3.29	14	---	3.19	16	---	3.09	11	-.583	L
Sample II	3.33	9	-.348	3.50	10	-1.11	3.09	11	---	C
9. Adaptation Retest										
Sample I	4.79	14	-.053	4.81	16	-1.55	4.09	11	---	C
Sample II	5.22	9	---	5.10	10	---	4.09	11	-2.63*	L
10. Achievement Retest										
Sample I	4.57	14	-.805	5.00	15	-.879	4.55	11	---	C
Sample II	4.67	9	-.750	5.22	9	-1.12	4.55	11	---	C

Success Criteria	High IQ Group High Aggression $\bar{X}$	N	high/medium t	Medium Aggression $\bar{X}$	N	low/medium t	Low Aggression $\bar{X}$	N	high/low t	Trend (L = Linear; C = Curvilinear)
1. Caldwell Retest										
Sample I	34.50	8	.499	33.35	17	-2.09*	36.62	21	---	C
Sample II	---	-	---	---	-	---	---	-	---	-
2. Reading Readiness										
Sample I	20.27	11	---	28.86	21	---	43.16	19	2.71*	L
Sample II	58.67	3	---	60.50	4	---	61.29	14	.160	L
3. School Tasks										
Sample I	22.57	7	-.317	23.43	14	.218	23.00	19	---	C
Sample II	25.53	3	-1.24	30.00	2	-1.42	25.50	10	---	C

Table 5 - continued

	High IQ Group									
	High Aggression			Medium Aggression			Low Aggression			Trend (L = Linear; C = Curvilinear)
Success Criteria			high/medium			low/medium			high/low	
	$\bar{X}$	N	t	$\bar{X}$	N	t	$\bar{X}$	N	t	
4. Social Conformity										
Sample I	22.00	7	---	24.06	17	---	26.21	19	1.92	L
Sample II	21.33	3	10.07**	30.00	2	-.927	27.62	13	---	C
5. Responsibility										
Sample I	19.14	7	---	21.29	17	---	24.21	19	2.03	L
Sample II	22.67	3	-4.26*	30.00	2	-1.42	25.54	13	---	C
6. Verbal Assertion										
Sample I	22.57	7	.560	21.20	15	-.809	22.74	19	---	C
Sample II	24.67	3	-.939	29.00	2	-1.09	25.64	11	---	C
7. Independence										
Sample I	23.71	7	.252	23.06	17	-.987	24.95	19	---	C
Sample II	24.66	3	-2.31	29.00	2	-.794	26.00	13	---	C
8. Kgtn. Readiness Retest										
Sample I	2.50	8	-.070	2.53	17	-2.04*	1.95	21	---	C
Sample II	---	--	---	---	--	---	---	--	---	-
9. Adaptation Retest										
Sample I	3.50	8	---	3.29	17	---	2.24	21	-3.11**	L
Sample II	---	--	---	---	--	---	---	--	---	-
10. Achievement Retest										
Sample I	3.38	8	-.145	3.47	17	-1.86	2.57	21	---	C
Sample II	---	--	---	---	--	---	---	--	---	-

*p .05; **p .01, two-tailed test

+Sample I contains working class children only; Sample II contains high-IQ, middle-class subjects as well as working-class ones. High scores on Report Card Summary Areas (Success Criteria 3-7) indicate high amounts of qualities named. High scores on Kindergarten Readiness, Adaptation, and Achievement indicate low amounts of the qualities named.

TABLE 6

The Interaction of the Behavior Inventory Summary Score of Verbal-Social Participation with Intelligence in the Prediction of Academic Achievement$^+$

Success Criteria	Low IQ Group									Trend (L = Linear; C = Curvilinear)
	High Verbal			Medium Verbal			Low Verbal			
			high/medium			low/medium			high/low	
	$\bar{X}$	N	t	$\bar{X}$	N	t	$\bar{X}$	N	t	
1. Caldwell Retest										
Sample I	31.60	10	4.12**	25.43	14	.509	26.24	17	---	C
Sample II	32.00	5	---	25.55	11	---	25.14	14	-3.22**	L
2. Reading Readiness										
Sample I	14.31	13	-.192	15.12	17	-1.39	10.25	16	---	C
Sample II	16.75	8	---	16.43	14	---	10.21	14	-1.88	L
3. School Tasks										
Sample I	13.60	5	---	13.64	11	---	15.79	14	.999	L
Sample II	15.33	3	.764	13.80	10	1.20	15.85	13	---	C
4. Social Conformity										
Sample I	21.80	10	.462	20.42	12	.282	21.13	16	---	C
Sample II	22.29	7	.536	20.45	11	.177	20.93	14	---	C
5. Responsibility										
Sample I	16.44	9	---	17.27	11	---	17.38	16	.398	L
Sample II	16.33	6	---	17.27	11	---	17.29	14	.342	L
6. Verbal Assertion										
Sample I	17.00	8	.901	15.40	10	.307	15.75	16	---	C
Sample II	17.67	6	1.28	15.40	10	.024	15.43	14	---	C
7. Independence										
Sample I	16.60	10	---	16.73	11	---	19.00	16	.992	L
Sample II	16.57	7	---	16.73	11	---	18.29	14	.628	L
8. Kgtn. Readiness Retest										
Sample I	2.80	10	-2.12*	3.57	14	1.35	3.12	17	---	C
Sample II	3.00	5	-1.28	3.55	11	-.954	3.21	14	---	C

Table 6 - continued

Success Criteria	Low IQ Group									Trend (L = Linear; C = Curvilinear)
	High Verbal			Medium Verbal			Low Verbal			
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
9. Adaptation Retest										
Sample I	4.10	10	---	4.43	14	---	5.06	17	1.91	L
Sample II	4.20	5	---	4.55	11	---	5.14	14	1.35	L
10. Achievement Retest										
Sample I	4.90	10	.532	4.62	13	.183	4.71	17	---	C
Sample II	5.20	5	.688	4.70	10	.025	4.71	14	---	C

Success Criteria	High IQ Group									Trend (L = Linear; C = Curvilinear)
	High Verbal			Medium Verbal			Low Verbal			
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
1. Caldwell Retest										
Sample I	35.73	15	---	35.42	19	---	33.58	12	-1.18	L
Sample II	41.00	5	---	41.00	6	---	35.33	3	-3.14*	L
2. Reading Readiness										
Sample I	37.25	20	---	31.50	20	---	29.08	12	-.864	L
Sample II	69.62	13	---	59.00	6	---	30.67	3	-2.91*	
3. School Tasks										
Sample I	23.79	14	---	23.58	17	---	21.00	9	-1.07	L
Sample II	27.33	9	---	25.75	4	---	21.00	2	-1.96	L
4. Social Conformity										
Sample I	25.00	14	---	24.65	17	---	24.33	12	-.317	L
Sample II	26.90	10	-.740	28.40	5	-1.68	24.00	3	---	C
5. Responsibility										
Sample I	23.29	14	---	21.76	17	---	21.67	12	-.624	L
Sample II	26.40	10	---	26.00	5	---	22.00	3	-1.81	L

Table 6 - continued

Success Criteria	High IQ Group									Trend (L = Linear; C = Curvilinear)
	High Verbal			Medium Verbal			Low Verbal			
			high/medium			low/medium			high/low	
	$\bar{X}$	N	t	$\bar{X}$	N	t	$\bar{X}$	N	t	
6. Verbal Assertion										
Sample I	23.43	14	---	22.47	17	---	19.80	10	-1.45	L
Sample II	26.67	9	---	26.00	4	---	23.33	3	-1.05	L
7. Independence										
Sample I	25.00	14	---	23.76	17	---	23.17	12	-.832	L
Sample II	24.80	10	-1.96	29.60	5	-4.44*	24.67	3	---	C
8. Kgtn. Readiness Retest										
Sample I	1.87	15	-2.27*	2.58	19	-1.05	2.25	12	---	C
Sample II	1.80	5	.380	2.00	6	-1.15	1.33	3	---	C
9. Adaptation Retest										
Sample I	2.47	15	-1.55	3.11	19	-.432	2.92	12	---	C
Sample II	2.80	5	---	2.67	6	---	2.67	3	-.122	L
10. Achievement Retest										
Sample I	2.67	15	---	3.16	19	---	3.33	12	1.13	L
Sample II	3.20	5	.704	2.50	6	1.53	3.33	3	---	C

*p .05; **p .01, two-tailed test

+Sample I contains working-class children only; Sample II contains high-IQ, middle-class subjects as well as working-class ones. High scores on Report Card Summary Scores (Success Criteria 3-7) indicate high amounts of the qualities named. High scores on Kindergarten Readiness, Adaptation, and Achievement indicate low amounts of the qualities named.

Table 7

The Interaction of the Behavior Inventory Summary Score of Independence with Intelligence in the Prediction of Academic Achievement$^+$

Success Criteria	Low IQ Group									Trend (L = Linear; C = Curvilinear)
	High Independence			Medium Independence			Low Independence			
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
1. Caldwell Retest										
Sample I	29.17	12	---	27.63	11	---	25.78	18	-1.85	L
Sample II	28.22	9	---	26.00	7	---	25.50	14	-1.33	L
2. Reading Readiness										
Sample I	15.92	12	1.52	10.77	13	.662	13.14	21	---	C
Sample II	16.60	10	1.21	11.22	9	.612	14.12	17	---	C
3. School Tasks										
Sample I	16.50	10	2.26*	12.57	7	1.14	14.31	13	---	C
Sample II	16.50	10	2.11	12.20	5	1.51	14.91	11	---	C
4. Social Conformity										
Sample I	21.36	11	-.236	22.10	10	-.629	20.29	17	---	C
Sample II	20.50	10	-.555	22.38	8	-.507	20.71	14	---	C
5. Responsibility										
Sample I	19.40	10	---	16.40	10	---	16.13	16	-1.71	L
Sample II	18.89	9	---	16.50	8	---	16.29	14	-1.30	L
6. Verbal Assertion										
Sample I	16.73	11	-.249	17.11	9	-2.13*	14.57	14	---	C
Sample II	16.60	10	---	16.57	7	---	14.92	13	-1.27	L
7. Independence										
Sample I	20.55	11	---	18.60	10	---	15.15	16	-2.86**	L
Sample II	19.60	10	---	18.25	8	---	15.15	14	-2.30*	L

Table 7 - continued

	Low IQ Group									
Success Criteria	High Independence			Medium Independence			Low Independence			Trend (L = Linear; C = Curvilinear)
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
8. Kgtn. Readiness Retest										
Sample I	2.83	12	---	3.09	11	---	3.50	18	1.93	L
Sample II	3.00	9	---	3.29	7	---	3.50	14	1.28	L
9. Adaptation Retest										
Sample I	4.33	12	---	4.64	11	---	4.78	18	.913	L
Sample II	4.56	9	---	4.86	7	---	4.86	14	.512	L
10. Achievement Retest										
Sample I	4.33	12	---	4.82	11	----	4.94	17	1.24	L
Sample II	4.44	9	---	4.71	7	---	5.08	13	1.07	L

	High IQ Group									
Success Criteria	High Independence			Medium Independence			Low Independence			Trend (L = Linear; C = Curvilinear)
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
1. Caldwell Retest										
Sample I	37.17	18	2.61*	33.40	20	.471	34.37	8	---	C
Sample II	41.00	8	1.28	37.75	4	.260	39.00	2	---	C
2. Reading Readiness										
Sample I	45.39	18	---	28.59	22	---	23.17	12	-2.63*	L
Sample II	66.69	16	---	53.75	4	---	34.50	2	-2.06	L
3. School Tasks										
Sample I	24.28	14	1.36	21.79	19	.953	24.14	7	---	C
Sample II	---	--	---	---	--	---	---	--	---	-
4. Social Conformity										
Sample I	24.21	14	---	24.40	20	---	26.00	9	.730	L
Sample II	26.75	12	.519	25.50	4	1.14	30.00	2	---	C

Table 7 - continued

Success Criteria	High IQ Group									Trend (L = Linear; C = Curvilinear)
	High Independence			Medium Independence			Low Independence			
			high/medium			low/medium			high/low	
	$\overline{X}$	N	*t*	$\overline{X}$	N	*t*	$\overline{X}$	N	*t*	
5. Responsibility										
Sample I	22.71	14	.744	21.00	20	1.30	24.22	9	---	C
Sample II	25.33	12	.131	25.00	4	.667	28.00	2	---	C
6. Verbal Assertion										
Sample I	23.86	14	1.45	21.16	19	.158	21.50	8	---	C
Sample II	26.00	10	---	26.00	4	---	25.00	2	-.258	L
7. Independence										
Sample I	26.00	14	1.89	22.30	20	1.07	24.67	9	---	C
Sample II	25.63	12	---	26.50	4	---	27.00	2	.297	L
8. Kgtn. Readiness Retest										
Sample I	1.89	18	-2.46*	2.60	20	-.903	2.25	8	---	C
Sample II	1.75	8	---	1.75	4	---	2.00	2	.381	L
9. Adaptation Retest										
Sample I	2.28	18	---	3.10	20	---	3.50	8	2.78*	L
Sample II	2.62	8	1.67	2.50	4	1.89	3.50	2	---	C
10. Achievement Retest										
Sample I	2.33	18	---	3.30	20	---	4.00	8	3.20**	L
Sample II	2.50	8	---	3.00	4	---	4.50	2	1.58	L

*p .05; **p .01, two-tailed test

+Sample I contains working-class children only; Sample II contains high-IQ, middle-class subjects as well as working-class ones. High scores on Report Card Summary Scores (Success Criteria 3-7) indicate high amounts of the qualities named. High scores on Kindergarten Readiness, Adaptation, and Achievement indicate low amounts of the qualities named.

Table 8

Interaction of the Behavior Inventory Summary Score of Achievement-Oriented Behavior with Intelligence in the Prediction of Academic Achievement$^+$

Success Criteria	Low IQ Group									Trend (L = Linear; C = Curvilinear)
	High Achiev.-Orient.			Medium Achieve.-Orient.			Low Achieve.-Orient.			
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
1. Caldwell Retest										
Sample I	34.33	6		27.22	18		24.44	16	-5.53**	L
Sample II	35.50	2		27.25	16		23.18	11	-6.09**	L
2. Reading Readiness										
Sample I	17.43	7		13.60	20		11.39	18	-1.28	L
Sample II	25.33	3		14.11	18		12.07	14	-1.74	L
3. School Tasks										
Sample I	15.50	4		14.92	13		13.83	12	-.938	L
Sample II	16.67	3		15.33	12		13.90	10	-1.32	L
4. Social Conformity										
Sample I	24.83	6		20.67	18		20.00	13	-1.62	L
Sample II	22.33	3		21.29	17		20.45	11	-.428	L
5. Responsibility										
Sample I	20.67	6		16.82	17		15.83	12	-2.11	L
Sample II	20.00	3		17.25	16		16.18	11	-1.16	L
6. Verbal Assertion										
Sample I	19.60	5	2.78*	15.18	17	-.084	15.27	11		C
Sample II	20.00	3		15.50	16		15.00	10	-2.66*	L
7. Independence										
Sample I	26.67	6		16.89	18		16.67	12	-2.33*	L
Sample II	22.00	3		17.29	17		16.55	11	-1.56	L

Table 8 - continued

Success Criteria	Low IQ Group									
	High Achieve-Orient.			Medium Achieve.-Orient.			Low Achieve.-Orient.			Trend (L = Linear; C = Curvilinear)
			high/medium			low/medium			high/low	
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
8. Kgtn. Readiness Retest										
Sample I	2.17	6		3.11	18		3.63	16	3.57**	L
Sample II	3.00	2		3.13	16		3.55	11	.907	L
9. Adaptation Retest										
Sample I	3.50	6		4.50	18		5.13	16	2.63*	L
Sample II	3.50	2		4.56	16		5.27	11	1.61	L
10. Achievement Retest										
Sample I	4.00	6		4.65	17		5.06	16	1.85	L
Sample II	3.50	2		4.73	15		5.09	11	1.75	L

Success Criteria	High IQ Group									
	High Achieve.-Orient.			Medium Achieve.-Orient.			Low Achieve.-Orient.			Trend (L = Linear; C = Curvilinear)
			high/medium			low/medium			high/low	
	X	N	t	X	N	t	X	N	t	
1. Caldwell Retest										
Sample I	36.89	18		33.86	22		33.20	5	-1.42	L
Sample II	---	--		---	--		---	--	---	-
2. Reading Readiness										
Sample I	41.32	19		28.59	27		22.00	5	-1.48	L
Sample II	---	--		---	--		---	--	---	-
3. School Tasks										
Sample I	24.53	15		22.16	19		20.80	5	-1.17	L
Sample II	---	--		---	--		---	--	---	-
4. Social Conformity										
Sample I	26.33	15		24.55	20		20.71	7	-2.58*	L
Sample II	---	--		---	--		---	--	---	-

Table 8 - continued

	High IQ Group									
Success Criteria	High Achieve.-Orient.		high/medium	Medium Achieve.-Orient		low/medium	Low Achieve.-Orient.		high/low	Trend (L = Linear; C = Curvilinear)
	$\overline{X}$	N	t	$\overline{X}$	N	t	$\overline{X}$	N	t	
5. Responsibility										
Sample I	24.00	15		21.90	20		18.29	7	-2.21*	L
Sample II	---	--		---	--		---	--	---	-
6. Verbal Assertion										
Sample I	24.93	15		21.16	19		17.33	6	-3.12**	L
Sample II	---	--		---	--		---	--	---	-
7. Independence										
Sample I	25.73	15		23.10	20		22.00	7	-1.53	L
Sample II	---	--		---	--		---	--	---	-
8. Kgtn. Readiness Retest										
Sample I	2.06	18		2.32	22		2.40	5	.696	L
Sample II	---	--		---	--		---	--	---	-
9. Adaptation Retest										
Sample I	2.22	18		3.18	22		3.80	5	2.62*	L
Sample II	---	--		---	--		---	--	---	-
10. Achievement Retest										
Sample I	2.22	18		3.45	22		4.40	5	3.19**	L
Sample II	---	--		---	--		---	--	---	-

*p < .05; **p < .01, two-tailed test

+Sample I contains working-class children only; Sample II contains high-IQ, middle-class subjects as well as working-class ones. In the high-IQ group, there were no low achievers in Sample II, and so no data is available for this group. High Scores on Report Card Summary Scores (Success Criteria 3-7) indicate high amounts of the qualities named. High Scores on Kindergarten Readiness, Adaptation, and Achievement indicate low amounts of the qualities named.

E. Comparative Use of Alternative Modes for Assessing Cognitive Development in Bilingual or Non-English Speaking Children

Principal Investigator: Virginia C. Shipman

Problem

As was indicated previously in the report on evaluation activites, the Seminole Indians comprised a unique sample. Program structure and child and classroom characteristics were at a high degree of variance with the Head Start programs in our other centers. Similarly, attempts to assess the children's cognitive development by means of the standard evaluation instruments were seriously hindered by the children's lack of facility with the English language and by sub-cultural differences in test behavior.

At the Big Cypress Center where the children understood some English but spoke it minimally, accurate basals on the Stanford-Binet could not be obtained for most of the youngsters during the initial testing. When the Caldwell-Soule was administered, the cultural bias of the verbal items increased their incomprehensibility. This was also true at the Hollywood Center where the children did speak English. For example, the standard reply to the question, "Which way does an elevator go?" was "In the water" (cf. alligator). With respect to differences in test-taking behavior, most of the Indian children tended to give minimal responses when asked for verbal rationales; on serial items they were likely to request approval before continuing, a condition not allowed on many items. When unwilling or unable to answer an item the child usually bowed his head or looked towards the floor, remaining so despite encouragement to respond until a new item was asked.

The study being reported here was an exploratory attempt to assess the feasibility of alternative methods for determining the cognitive development of bilingual or non-English speaking children from a disparate cultural background.

Method

The subjects were twenty Seminole Indian children attending the Hollywood Head Start Center (C.A. 4-8 to 6-5) and eight Seminole Indian children attending the Big Cypress Center (C.A. 4-8 to 6-4). (For a description of these markedly different reservations, see the report on evaluation.* Subjects were administered the Ravens Colored Progressive Matrices, sets A, Ab and B, Form Board version; three Piagetian measures designed to assess the child's stage of concrete operations (conservation of volume and length and a dream interview) and two measures of classificatory behavior (class inclusion and an object sorting task). A month later, at the time of evaluation post-testing, 26 of the 28 subjects were administered the Stanford-Binet, Form LM according to the Wright short method. Except for six children (five of whom were six-year-olds), all subjects were in the evaluation sample.

The Ravens Colored Matrices is purported to assess a person's present capacity for intellectual activity, irrespective of his acquired knowledge. Sets A, Ab and B are arranged to assess mental development up to the stage when a person is sufficiently able to reason by analogy. Since the test was designed for use with young children and in anthropological studies as it can be used satisfactorily with anyone who cannot understand or speak English, it was considered especially appropriate for this study. The board form of the test is especially suitable for work with young children. Each problem is presented in the form of a board with a part removed and with six movable pieces each of which exactly fits the space in the board. The child can be shown that each piece fits the gap in the board but that only one completes the pattern. By placing a selected piece in position he sees the result of his judgment. As the manual points out. other advantages of the board form over the book form are that solutions by trial and error can be observed, recorded and compared with solutions by direct perception and inference. Moreover, it is possible to record easily and accurately the successive judgments a person acts on in attempting to solve a progressive series of problems. Its bright colors and the fact that it is untimed also make it more appealing for work with young children. In this study the subjects apparently understood the task with a minimum of verbal instruction. Most of them seemed to thoroughly enjoy being able to manipulate the attractive designs and remained attentive throughout the thirty-six items.

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*All children over $4\frac{1}{2}$ attending the Head Start classes during the time of testing were included in this study.

Instructions for the Piagetian tasks used are included in the Appendix. In order to make comparisons later with an urban Negro sample from varying socio-economic backgrounds, the same procedures were employed as used in the follow-up study of maternal influences upon cognition described in Research Report A. The administration and coding procedures were those developed by Dr. Lawrence Kohlberg. The tasks included various assessments of the child's capacity to distinguish external reality from subjective appearance under conditions of varying perceptual distortion. The tasks utilize objects with which most children have had physical experience, and they allow nonverbal conceptualization. Consumables were used in the conservation tasks to facilitate the subject's involvement in making a correct choice. Although these tasks were first developed with white middle-class children, they were found to be meaningful also for 4-year-old Negro culturally disadvantaged children. Various stages of responses were represented within each task, as with the middle-class children, but the average stage of development was less advanced for the culturally disadvantaged child.

One of the most common ways of studying conceptual development has been the study of classificatory behavior. The Concept Sorting Task devised by Kohlberg (1963) consisted of having the child sort a set of eighteen dolls. Upon his recommendation, for this study we used a modified version consisting of fifteen human figure dolls, excluding the three nonhuman dolls in the original task. Instructions for the task are found in the Appendix. The sorting task allows for assessment of the sorting modes of the children and their verbalizations. In addition, a scale based on a three-stage sequence of concept formation proposed by Piaget is derived which incorporates an analysis of the sorting modes in relation to both extensional and intensional characteristics of the objects sorted. Previous work by both Kohlberg and Stodolsky (1965) indicated that the stages of concept formation measured by this task do have generalizability beyond the middle-class population on which it had been developed.

The modes of sorting measured by this task encompass a concrete to abstract (categorical) continuum, coupled with refinements to take into account extensional (generality) aspects of the concepts. Five modes of sorting are assessed by the task: associative, identity, descriptive, collective, and categorical. These modes of sorting (with the exception of collective) were found to form a developmental or age-related sequence by Kohlberg (1963) They are discussed below in the developmental order found.

An associative sort is one in which the child places objects together for an idiosyncratic reason or one based on individual experience. For example, two objects are placed together because they "like each other." The sort is not based on any perceptual similarity between the objects and as such the sort does not form a class.

An identity sort is one in which two nearly identical objects are put together. The stimulus array consisted of objects which could be put in groups of three to form a category. For example, three boys and three girls were in the array. Each group of three contained two objects which were identical in terms of material, size, and color of dress. The third object in the class was made of different materials and of different size. If the child grouped the two nearly identical objects, his sort was considered to be "identity."

A descriptive sort was one based on perceptual similarities between the objects. For example, a child could place all dolls with blond hair or all dolls dressed in red together.

A collective sort was the formation of a family. At least a mother, a father, and one child had to be included.

A categorical sort was one in which the child formed a class including at least three objects. Sex, age, and sex-age were the possible criteria for a categorical sort in this task.

The grouping of the dolls which the child made was recorded along with his response to a verbal probe as to why he made the sort. The scoring scheme utilized was Stoldolsky's modification of the original Kohlberg system to allow for completely independent scoring of the mode of the object sort and the verbalization. This was considered particularly important in light of the difficulties encountered with some of the children in eliciting verbal responses. An inter-scorer reliability estimate of the non-verbal scoring scheme produced 95 per cent agreement. The scoring for the verbalizations and the Guttman scale are those used by Kohlberg (1963) with only minor modification.

It was possible to obtain four interrelated scores from the sorting tasks: the Guttman scale score of concept formation, the Non verbal score, the Verbal score, and an average of the last two. These last three measures were obtained by weighting the percentage of each sort mode (1 for associative, 2 for identity, 3 for descriptive and collective, 4 for categorical).

Results and Discussion

Ravens Colored Progressive Matrices

For the Hollywood Center, the range of scores on the Ravens was 5-23 with a mean of 12.6. According to English norms for children of comparable age, the Indian children scored between the 10th to 93rd percentile, with the average score at the median for five-and-a-half-year-olds. Similarly, the subjects from the Big Cypress Center obtained scores ranging from 6-21 (5th to 93rd percentile) with a mean score of 12.5. The mean C.A. for the group was 66 months so that a score of 12.5 would be at the median.

In contrast, the Stanford-Binet I.Q.s obtained ranged from 66-117 (2nd to 82nd percentile), with a mean of 86 (17th percentile) for the Hollywood Center and from 39-90 (.1 to 17th percentile) with a mean of 71.8 (3rd percentile) for the Big Cypress Center. The correlation between the two tasks was -.20 for Hollywood and .52 for Big Cypress.

As a measure of the child's present clarity of observation and level of intellectual development, the Ravens appears to provide greater differentiation among the Indian children than does the Stanford-Binet. Although not a test of general intelligence, Sets A, Ab, and B do indicate whether the subject is capable of forming comparisons and reasoning by analogy; and if not, to what extent, relative to other people, he is capable of organizing spatial perceptions into systematically related wholes and analyzing them into their components. A few of the younger children exhibited what Ravens refers to as "passive perception", reacting to the figures as presenting no problem. Most, however, if not perceiving the logical solution by analogy, tended to attempt to repeat a pattern in the design.

Due to the Indian children's unwillingness and/or inability to answer verbal items, it was expected that there would be a reduced relationship between the Binet and Ravens. Although previous research findings have given varied and conflicting estimates of the degree and direction of the relationship between the Binet and Ravens, a negative correlation for the English-speaking Indian children was quite unexpected. Considering the small sample size and error of measurement, such a result can provoke only increased effort toward further research to explore the underlying processes involved. Since the sequence in which the problems are presented in the Ravens test provides training in the method of thinking, one might look at the child's performance as a measure of his ability to utilize the training offered. Thus, a child obtaining a low score on the Binet may be one whose environment has provided him with a limited fund of knowledge. His Ravens score, however, may indicate his ability to think logically given the appropriate stimulus cues. In contrast, a child may have received the culturally expected school-relevant knowledge but not have been encouraged in those activities facilitating the development of abstract thinking. Since the Ravens is reported to be more susceptible to present fluctuations in motivation, fatigue, illness, et cetera, the interval between administration of the Ravens and Binet would also act to lower the correlation. Another suggested causal factor is a reduced intercorrelation due to emotional instability. During our several visits to the Hollywood Center it was informally observed that in contrast to our other Head Start samples, many of the children showed speech hesitancies and stammering, and the majority bit their nails or kept their fingers in their mouth during testing. It has generally been found that children with emotional problems show a greater discrepancy between measures of acquired knowledge and present functioning. Item analysis of the Binet may yield further clues concerning the obtained relationship. Informal inspection of the data indicated that many of the Indian children performed best on the perceptual discrimination items; success or failure on these items may be positively related to performance on the Ravens.

Conservation of Length and Volume

The results for these tasks are being considered together since the data are highly similar. As indicated above, on these tasks the child was asked to distinguish external reality from subjective appearance under conditions of varying perceptual distortion. The brightly colored gum sticks and the beakers of Coke seemed highly attractive to the children, and they appeared eager to do what was required to obtain them.

With the possible exception of two children, none of the Indian children could be considered conservers on these measures. Although almost all the children indicated by their responses that they discriminated the length of the straws, only two Hollywood subjects (a boy and a girl aged 5-4) conserved when the short straw was advanced towards them. Six other Hollywood children conserved when the straw was bent, but only one child, the five-year-old boy, conserved consistently nonverbally. Out of 28 subjects, only eleven offered any reasons for their responses, but all were non-conserving rationales (e.g., "because you moved it", "it growed"). On the liquid conservation task, which usually has been found to be more difficult, only two subjects consistently conserved (the same boy who conserved on the length conservation task and another five-and-a-half-year-old boy from the Hollywood Center), although seven subjects conserved with help. Twelve of the children might be considered partial conservers, but they also may have merely perseverated on the unpoured glass. Again, no conserving verbal rationales were given; instead, the children referred to the glass size, height of the liquid, or to the fact that the experimenter poured it. Even though on the memory question the children indicated they remembered how the beakers were before pouring, they still said the amount of liquid or beakers had been changed.

For this small sample, then, the Indian children, especially those living on a remote reservation, were considerably retarded in their stage of cognitive development as assessed by these measures. They performed considerably below the level usually reported for children in this age range on the length conservation task. In comparison with our findings for $5\frac{1}{2}$ to 6-year-old urban Negro culturally disadvantaged children they also were less able to conserve on the liquid conservation task. In the latter case, however, the difference, though in the same direction, was not statistically significant. As had been found in previous research, one could not predict the child's stage of concrete operations from his performance on the Binet. These tasks measure different aspects of cognitive functioning. In contrast, the children who made consistent conserving choices performed above the 75th percentile on the Ravens.

Dream Interview

Many of the children were unable or unwilling to report dreams. However, with considerable urging they did respond to further questioning and to the monkey prompt described later in the protocol. Although most subjects indicated they knew what a dream was, only three seemed fully aware that a dream is not real and thought that dreams took place inside. None scored at a higher conceptual level. Most of the Indian children reported dreams came from Jesus. There were many response inconsistencies, with children scoring minus on question 3 but plus on questions 4 or 5. For this sample the items did not scale.

The data for this task are consistent with previous findings indicating that the five- to six-year-old expresses modified realism concerning dreams. Most of the Indian children, although stating that dreams had an internal origin or occurred within them, seemed uncertain about internality and contradicted it or ignored it in later parts of the protocol. Kohlberg had found this stage representative for children aged 5-8 and Pinard and Larendeau for children aged 5-0. Although subjective or interiorized replies were offered with more certitude, there was still confusion between the external and internal nature of a dream for Kohlberg's group at 6-0 and for Pinard and Larendeau's subjects at 5-8. All subjects in this study who responded correctly for scale item 6 and above obtained an I.Q. above 90 on the Stanford-Binet. Except for one child they also scored above the median on the Ravens.

Class Inclusion

The class inclusion data suggest considerable need for revision of this procedure as it is highly dependent on the child's verbal facility. The task seemed a semantic rather than a conceptual problem. Although most of the children made the initial discrimination of placing all candies and all chocolates in the experimenter's hands, they were inconsistent or completely failed the following items. "Some" or "any" was too difficult a concept and tended only to confuse them. Subjects tended to answer "yes" to all items suggestive of a switch from task-orientation to experimenter-orientation as the task became more meaningless for them. Only three children were consistent at the beginning in saying there were more candies, although eight children who said there were initially more chocolates than candies changed their response in the process of questioning. As was the case with the previously discussed tasks, none of the children were able to state a conserving rationale for their choices. The two boys who consistently differentiated correctly between chocolates and candies, although obtaining Binet I.Q.s of 78 and 90, both scored above the 90th percentile on the Ravens.

Object Sorting Task

Four measures were derived from the Kohlberg Sorting Task. Each child was given a scale score which incorporated the ratings of the child's sort according to properties of sorting which Piaget had observed. The scale attributes may be found in the Appendix. The highest sort scale achieved in this sample was six, the lowest zero, with the majority obtaining a three. This is to be expected as the scale is applicable through age eight. The qualitative types of sorts which the children made (associative, identity, descriptive, collective and categorical) were used to form a nonverbal and verbal score. These sorting modes were weighted according to their developmental order. The nonverbal sort score refers to the children's object sorts. The verbal score is an index of their verbalizations about the object sorts. Finally, an average of the verbal and nonverbal scores was available.

The modes of sorting analysis was based on the work of Kagan, Rapaport, Sigel and others and incorporated a concrete to abstract dimension of development. Since the scale score and the scores of the modes of sorting hierarchy had been found to correlate quite highly, Kohlberg concluded that "the findings of students in the Rapaport and Goldstein framework are applicable to Piaget's theory if abstract concept formation reflects attainment of Piaget's operational stage" (Kohlberg, 1963, p. 129). Thus, the scores derived from the sorting task may be viewed as alternate formulations of highly similar phenomena. However, because of our subjects' known difficulty in verbalizing rationales, a means of scoring the nonverbal behavior of the children independent of their verbalizations was necessary. This was confirmed by the lack of relationship obtained between the nonverbal and verbal scores (_r_ = .20 for the Hollywood _Ss_ and zero for Big Cypress _Ss_). Similarly, although the nonverbal score was highly correlated with the scale score (_r_ = .92 for Hollywood and .94 for Big Cypress), the verbal score was essentially unrelated to the scale score (_r_ = .19 for Hollywood and zero for Big Cypress). These results reflect the fact that the majority of subjects did not express rationales for their sorts. It should also be noted that for this sample the items did not consistently scale. Some subjects used all objects but gave predominantly associative responses; others were able to use complementary classes as requested in question 2, but did not include all members of a class in more than 50% of spontaneous groupings.

Table 1 contains the summary statistics for these two Centers on these sorting measures in addition to those for Stodolsky's urban Negro sample of five-year-olds.

TABLE 1
MEAN SORTING SCORES FOR TWO ETHNIC PRESCHOOL GROUPS

SAMPLE	N	SCORES			
		NONVERBAL	VERBAL	AVERAGE	SCALE
Seminole Indians					
Hollywood	20	215.66	86.68	151.17	2.95
Big Cypress	8	112.49	0.00	56.24	1.12
TOTAL	28	164.08	43.34	103.70	2.04
Urban Negro					
Upper-Middle	20	263.11	281.67	272.61	3.83
Upper-Lower	20	261.37	256.53	259.16	3.58
Lower-Lower	20	217.37	176.68	197.37	2.89
TOTAL	60	247.00	237.52	242.52	3.43

Consistent with the findings reported earlier, the Indian children tended to perform somewhat below the level expected for their age group. Several children in both Centers were unable or unwilling to sort the dolls after repeated urging. Although the data from the Hollywood Center are similar to those for the lower-lower class Negro sample with respect to the nonverbal and scale scores, the Indian children scored particularly low on the verbal measure. The discrepancy between the verbal and nonverbal modes for both Centers was highly significant. Similarly, the discrepancy for the lower-lower class Negro sample approached statistical significance. These children, though performing at a low level in general, performed much more adequately in the physical manipulation of the dolls. This is consistent with the finding that one of the most severe difficulties of culturally disadvantaged children is their inability to verbalize, more specifically, to answer questions. As was the case with their performance on the other tasks, striking differences were found between the Hollywood and Big Cypress groups, with the rural Indian children performing at a much lower level. Even with directions given in Miccosukee the Big Cypress subjects seemed to find the task too difficult.

Also of interest is the distribution of the sorting modes used by this sample. Table 2 contains the percentage of each sorting mode used by this Indian sample of Head Start youngsters. It also contains the average percentage of responses made by Kohlberg's four- and five-year-olds (unfortunately, the verbal and nonverbal scores on his sample were not available) and the percentage of each sorting mode used by Stodolsky's urban Negro sample of five-year-olds.

TABLE 2
MEAN PERCENT USE OF EACH SORTING MODE BY THREE ETHNIC SAMPLES

SAMPLE	ASSOCIATIVE	IDENTITY	DESCRIPTIVE	COLLECTIVE	CATEGORICAL	NO VERBALIZATION OR SORT
Seminole Indians						
Nonverbal Sorts						
Hollywood	22	30	5	1	29	14
Big Cypress	22	9	0	4	15	50
Total	22	20	2	2	22	32
Verbal Sorts						
Hollywood	6	14	7	0	8	65
Big Cypress	0	0	0	0	0	100
Total	3	7	4	0	4	82
Stodolsky (Urban Negro)						
Nonverbal Sorts						
Upper-Middle	17	32	18	4	29	--
Upper-Lower	20	30	16	2	32	--
Lower-Lower	37	27	16	2	18	--
Total	24	30	17	3	26	--
Verbal Sorts						
Upper Middle	15	13	33	5	33	2
Upper-Lower	25	13	24	1	32	4
Lower-Lower	19	5	30	1	14	31
Total	20	11	29	2	26	12
Kohlberg average (Urban white)						
Five-year-olds	12	35	18	13	21	--
Four-year-olds	62	27	10	2	--	--

In general, the responses of this sample and those of Stodolsky's lower class urban Negro sample are similar when considering only the nonverbal scores. Although our sample contains children over $5\frac{1}{2}$ years old, their performance appears to lie somewhere between that of Kohlberg's four- and five-year age groups. Again we find the Indian children, especially those living on a remote reservation, to be performing at a less advanced stage of cognitive functioning for their age group.

The three samples reveal an interesting difference in regard to the collective (family) sort mode. Initially, Kohlberg (1963) felt that this type of sort was a "slight advance" conceptually beyond an associative response in which relationships between people are the defining characteristics. His age trends, however, led to placement of the collective mode just beyond the descriptive mode. In our data, as in Stodolsky's data, the collective mode virtually drops out. We can only speculate as to why this difference occurs. If the age trends observed by Kohlberg are correct, then we would expect the collective mode to appear more frequently as this sample gets older and assume that they are slightly behind the Kohlberg sample in this regard. This would not be inconsistent with the other figures in the table. However, alternative interpretations are possible. It may be psychologically significant that a white sample of children produced collective sorts while a Negro and Indian sample did not. It may be that either the white color of the dolls or other psychological factors inhibited the production of collective responses in these groups. The less stable family patterns in these communities might make this a more affect-laden response for these children.

Conflicting data emerge when comparing performance on the various tasks utilized in this study. A score of 4 or higher on the sorting scale is considered to be a high level of thought for a five-year-old. Kohlberg (1963) found that 33 per cent of his middle-class five-year-olds achieved this level. Thirty-eight per cent of Stodolsky's sample reached that level. Consistent with their poorer performance only 17 per cent of the Hollywood subjects (CA 5-6 to 6-4) and none of the Big Cypress subjects reached that level. For three of these children, Binet I.Q.s ranged between 78 - 82, with Ravens Scores above the 75th percentile. The fourth subject performed very poorly on the Ravens (below 10th percentile), but obtained an I.Q. of 117 on the Stanford-Binet. None of these subjects had nonverbally conserved on the length and volume measures or obtained a high scale score on the class inclusion task; only one of them obtained a relatively high scale score for his dream responses. Thus we find a suggested separation of classificatory behavior from other types of cognitive functioning.

As the data in Tables 1 and 2 reflect, no child with inadequate language development performed at a high level of sorting. The marked difference in results for the Hollywood and Big Cypress samples is additional support for the idea that language is a necessary condition for high level thought in the child. Language is not a sufficient condition for high level thought in the child, however. This may be seen by the fact that children within the adequate language group at Hollywood with Binet I.Q.s above 90 performed at both high and low levels on the sorting task. Thus, after minimum language has been obtained, there are still other factors which enter into determining the child's level of thought. Prior to the attainment of minimum language, it does not seem possible for the child to move to high level thought. Similarly, Stodolsky (1965) found that all her subjects who were categorized as low language on the Peabody were categorized also as low on thought using the verbal or nonverbal sort measures. She also obtained a large difference in nonverbal and verbal behavior in the low language group reflecting the fact that many of these children were unable to give reasons for their sorting or gave associative ones. Both sets of findings are consistent with the theory of language and thought proposed by Vygotsky (1962) and Luria (1959). These investigators demonstrated that the acquisition of speech is a prerequisite to self-regulation of behavior. Viewing both language and thought as developmental processes, they found language development to be developmentally prior to certain levels of conceptualization.

Conclusions

As was emphasized in the beginning, this was an exploratory study. The smallness of the sample size makes it subject to large chance fluctuations. Consequently, the findings must be regarded as highly tentative.

Considering the above-mentioned cautions and the absence of a counterbalanced order of presentation for the various tasks, one hesitates to make inter-task comparisons. Nevertheless, the data do tend to support the utilization of a variety of measures for assessing cognitive development rather than a single measure of general intelligence. This enables one to differentiate the individual's level of acquired knowledge and his present modes of problem-solving, thereby facilitating individually-oriented educational planning.

With the exception of the class-inclusion measure, the present tasks can be recommended for their motivational properties and ability to hold the young child's fluctuating attention. One is more likely to obtain an accurate assessment of the child's level of functioning with a task he enjoys and feels he comprehends. Although we attempted to minimize verbal requirements in order to reduce the confounding of expressive difficulties with conceptual ones, we were only partially successful. In future studies employing Indian children as subjects, we hope to reduce further the demands for verbal response by modifying present procedures and adding new measures. It should be noted that the Ravens, which required a minimum of verbal response, showed the least deficit for these children. It also tended to be a better predictor of the child's functioning on other tasks. As discussed further below, adjusting to the child's inability or reluctance to answer questions by emphasizing nonverbal responses does not, however, eliminate decrements due to linguistic difficulties.

The data were consistent in indicating a less advanced stage of cognitive development for the Indian children. Moreover, those subjects living under the more restricted, impoverished conditions in effect on the Big Cypress reservation performed considerably poorer. In the absence of stimulation the development of logical thinking appears to develop later. These results are consistent with previously reported findings on the effects of cultural disadvantage on intellectual functioning.

Future studies, in addition to attempting to replicate the present findings with a more adequate sized sample, should focus on delineating the nature of the environmental variables affecting these responses.

The results for the sorting tasks in particular suggest that language impoverishment is contributing to this retardation in cognitive growth. Previous research by this investigator (1965) has shown the interfering effect of a restricted language environment upon cognitive performance, especially in the area of categorizing behavior. The processes which theory dictates as essential for language learning are: 1) exposure to an adequate language model, 2) opportunity for practice and 3) corrective feedback. Further research is needed to study the extent to which the Indian child's behavior is mediated by verbal cues which offer opportunities for using language as a tool for labelling and ordering stimuli in the environment. In addition, the development of thought and cognitive processes of problem-solving might be fruitfully studied through analysis of the communication styles evolving from the structure of the Seminole Indian social system and the structure of the family.

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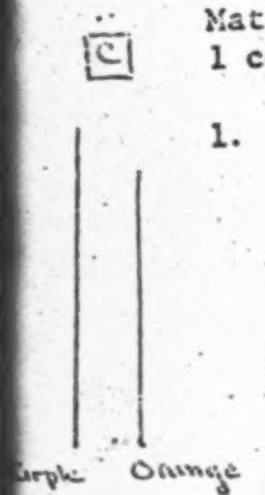
APPENDIX TO RESEARCH E - TASK DESCRIPTIONS

PRE-SCHOOL PROJECT, SUMMER 1967

Code Sex Age Date Tester

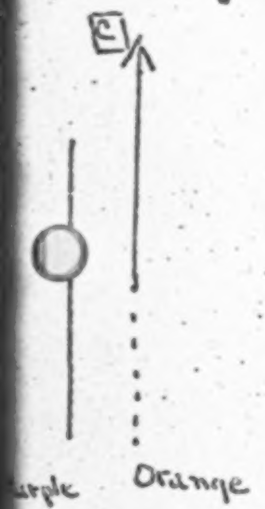
Materials: 4 pairs of 4" and 4¼" gum sticks. Three pairs are 2 colors, 1 pair is 1 color.



1. (One orange 4" and purple 4¼", placed parallel to child's line of sight, with ends farthest from child aligned)
Here are two sticks One is bigger and longer than the other You don't need to show me, but can you see that one is bigger and longer than the other?

Yes No

When I say so, you can pick the bigger and longer. One is to keep or chew If you don't pick the biggest one, you won't get gum this time. You'll get another chance to get gum later. Before you pick I put them like this (Place finger in center of orange stick and slide it toward child so that it extends about ½" beyond other stick)



Now, look at them If you can show me the biggest and longest one, I'll give it to you to chew after while

______picks longer purple (Let child take gum and then move to Q3)

______picks shorter orange (Ask the following and then move to Q2)

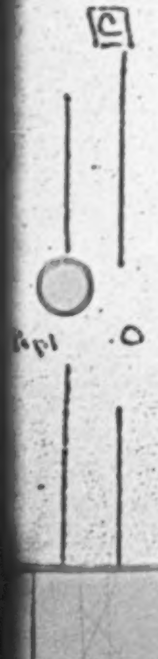
How could you tell it was bigger?

(If says "I looked at it," or I saw this was biggest," or similar ambiguous response which could refer to remembrance of which was bigger prior to advance, then ask following Q:)

When did you see it (look)?

(If says "I measured," or demonstrates by measuring, replace in advanced position and ask following Q:)

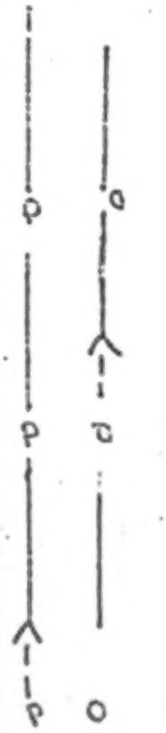
But how can you tell when its like this?



2. (Give this question only if child picked shorter orange on Q1)
(If sticks have been moved so that orange stick is not advanced toward child, replace them in this postion)
You told me this was the biggest one (point to orange)
(Place finger in center of purple stick and move it toward child so that it ext
about ½" beyond other stick)
Now show me the big one.

______picks longer purple (move to 2a)

______picks shorter orange (move to 2b)



a. (If chose longer purple in 2 above. Replace sticks in original position, with ends farthest from child aligned, and then move orange stick toward child so that it extends ½" past purple)

Before you said this (point to orange) was biggest.

(Move purple stick toward child so that it extends ½" past orange)

Now you say this (point to purple) is bigger. Do they really change bigness?

How is that (How does that happen)

(Move to Q5)

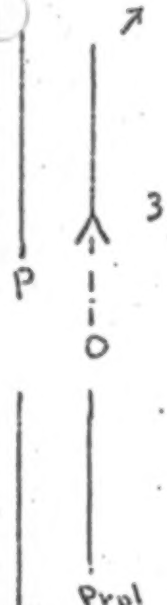
b. (If shorter orange was chosen in 2 above. Move orange stick toward child so that ends of stick farthest from child are aligned)

You said this was biggest (point to orange). Is it biggest now?

Do they really change bigness?

How is that (ie, how does that happen?)

(Move to Q5)



3. (Give this Q only if child picked longer purple on Q1)

(Take two other sticks of gum, one $4\frac{1}{4}$" pink, one 4" purple. Place them parallel to child's line of sight, with ends closest to child aligned)

Here are two more sticks of gum. One is bigger and longer than the other. You don't need to show me, but can you see that one is bigger and longer then the other?

Yes No

When I say so you can pick the bigger and longer one to keep or chew. If you don't pick the biggest one, you won't get gum this time. You'll get another chance to get gum later. Now before you pick, I put them like this.

(Place finger in center of purple stick and move it away from child so that it extends about ½" beyond the pink stick.)

Now look at them. If you can show me the biggest (and longest) one, I'll give it to you to chew after a while.

_____picks longer pink stick (move to Q4c after asking the following Q)

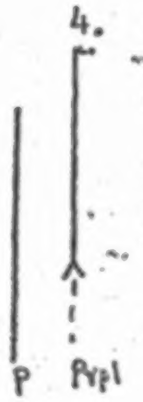
_____picks shorter purple stick (move to Q4 after asking the following Q)

How could you tell it was Bigger?

(If says "I looked at it," "I saw this was biggest," or similar ambiguous response which could refer to remembrance of which was bigger prior to advance, ask:)

When did you look (see it)?

4. (Start here only if picked shorter purple on Q3)
(If pieces have been moved so that purple stick is not advanced away from child, replace in this position)



You told me this (point to purple) was the biggest one. (Place finger in center of shorter purple stick and move it toward child so that it extends ½" beyond other stick)

Now show me the big one

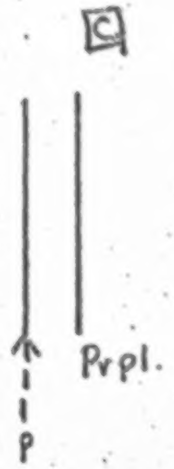
______picks longer pink

(Replace sticks in original position, with ends closest to child aligned, and then, while talking, move purple away from child) Before you said this (pt. to purple) was biggest. Now (move pink stick so it extends ½" beyond purple) you say this (pt. to purple) is bigger. Do they really change bigness?

How is that? (ie, how does that happen)

(Move to Q5)

_____picks shorter purple

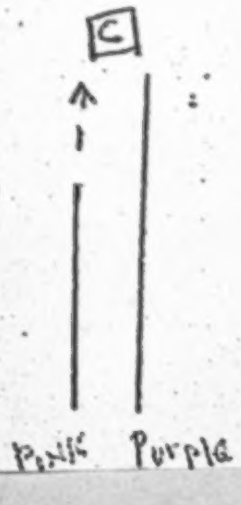


b. (Move pink stick toward child so that ends of sticks close to child are aligned)
You said this (pt. to purple) was biggest. Is it biggest now?

Do they really change bigness?

How is that?

Move to question 5



c. (Point to pink stick) This follows Q3 if said long pink was biggest.
You said this is biggest.
(Place finger in center of short purple stick and move it toward child so that the end nearest the child extends ½" beyond other stick)
Now show me the big one.

______Picks longer pink stick: (move to Q 5)

______Picks shorter purple stick (move to 4D)

d. (Replace sticks in original position, with ends closest to child aligned.) Before (move purple away from child so it extends ½" beyond pink) you said this (point to pink) was biggest.
Now (move purple toward child so it extends ½" beyond pink at end closest to child) you say this (point to purple) is biggest. Do they really change bigness?

How is that? How does that happen?

Move to Q5

5. (One 4" pink, one 4¼" orange placed parallel to child's line of sight, with ends aligned in accordance with which way he is seeing illusion, i.e., if incorrect and picked orange on Q 1, align ends farthest from child; if incorrect on 3 and picked purple, align ends closest to child; if correct on 1 and 3, align ends closest to child if boy and farthest if girl)

Here are two candy sticks. See, one is bigger, one is longer? When I say so, you can pick the bigger one to keep or to eat. If you don't pick the biggest one, you won't get gum this time. You'll get another chance to get gum later. Now, before you pick, I put them like this. (Bend orange stick so that a straight lin drawn from end to end would be about 3 3/4" keeping alignment at one end with straight stick and not picking up from table.)

Now look at them. If you can show me the biggest one, I'll give it to you to eat after while.

______Picks correct orange

______Picks incorrect pink

Go to Q6, All Children.

C

6. (One 4", one 4¼" of the same color, randomly arranged, non-parallel) Here are tw gum sticks. Show me the bigger one.

______Picks longer stick

______Picks shorter stick

______Measures

Show me how you can tell which is bigger.

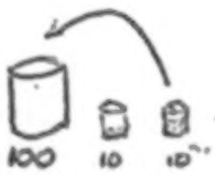
How can you make sure?

PRE-SCHOOL PROJECT, Summer 1967

____
code sex age date tester

Materials: 1 100 ml beaker, 2 10 ml beakers, 1 5 ml graduate, 2 10 ml graduates one of which has been cut down at the top, ½ cup coke or liquid.

Seat child so that table top is at eye level.



1. (Two 10 ml beakers and one 100 ml beaker)
Now I'm going to put some coke in these glasses. After a while we'll drink some. (Pour coke in both 10 ml glasses, with more in one). You don't need to show me, but can you see I put more coke in one glass than the other?

________ Yes

________ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you won't get any this time. You'll get another chance to drink some later. Now, before you pick, I take this one (10 with more coke) and pour the coke all out into this one (100 ml beaker). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

________ Picks correct 100 (ask Q's below)

________ Picks incorrect 10 (ask Q's below)

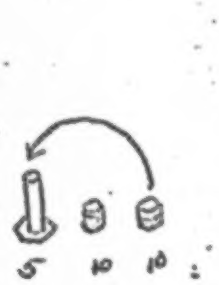
Did that one have more?

How could you tell?

(If says because empty was more:) But how can you tell now when it's like this (pointing to 100)?

(If says because it was more:) When was it more?

(Let child drink coke in glass he chose.)



2. (Two 10 ml beakers and one 5 ml graduate)
Now let's fill these two glasses. Now I fill this glass (one of 10's) up to the very top. I don't fill this (other 10) glass up. Now, see, I put more coke in one glass than the other. You don't need to show me but can you see that one glass has more coke?

________ Yes

________ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you won't get any this time, but you'll get another chance to drink some later. Now, before you pick, I take this one (10 with lesser amount) and pour the coke all out into this one (graduate). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

______ Picks correct beaker(Ask Q's below; then let child drink and go to 2a)

______ Picks incorrect graduate (Ask Q's below; then move to Q 3 or 4)

Does that have more?

How could you tell?

Show me how you could be sure?

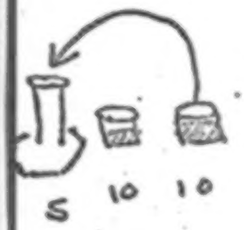
(If says because empty had less:) But how can you tell when it's like this (pointing to grad)?

(If says because it was more:) When was it more?

(If picked correct beaker, let child drink.)

(If incorrect on both Q 1 and 2, don't let child drink yet. Move to Q4.)

2a ~~2~~. (If correct on Q 1 and correct on Q 2:)



(Two 10 ml beakers and one 5 ml graduate)
Now let's pour some more coke. Now I fill this glass (one of 10's filled to just below top of white dot). But I don't fill this (other 10) glass up. Now, see, I put more coke in one glass than the other. You don't need to show me, but can you see that one glass has more coke?

______ Yes

______ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you son't get any this time, but you'll get another chance to drink some later. Now before you pick, I take this one (10 with greater amount) and pour the coke all out into this one (graduate). Now look at them. If you can show me the one with more to drink, I'll give it to you.

______ Picks correct graduate (ask Q's below, then let child drink)

______ Picks incorrect beaker (ask Q's below, go to 2b)

Does that have more?

How could you tell?

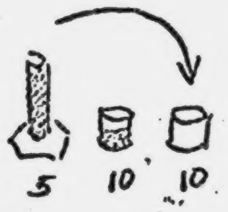
Show me how you could be sure?

2b. (If incorrect on 2a)
Which one had more before I poured it?

_____ Picks correct empty beaker

_____ Picks incorrect beaker with coke

Now, this one (point to graduate) has more coke in it. This one (point to beaker with less coke) has less. See (pouring graduate back into beaker), it's more. Then this (pointing to beaker with more) has more. Now, I pour it back (pour from beaker with more into graduate). Now look at them (pause). Now, you take the one with more coke to drink.

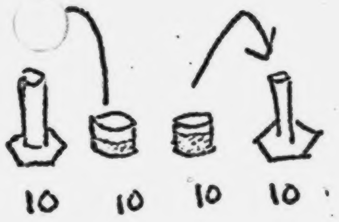


_____ Picks correct graduate (let child drink choice and terminate test)

_____ Picks incorrect beaker (ask Q's below)
Does it really get to be less when I put it in here (point to graduate)? How does that happen?

(Let child drink his choice and terminate test.)

3. (If picked correct 100 on Q 1 and incorrect graduate on Q 2:)



(Two 10 ml beakers and two 10 ml graduates, one of which has been cut to a shorter height) Now let's pour some more coke. (Pour coke into two 10 ml beakers, with more in one) Can you see that I put more coke in one glass?

_____ Yes

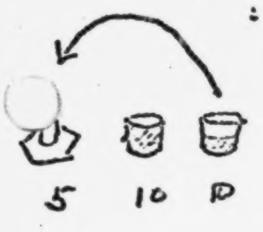
_____ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you won't get any to drink this time. You'll get another chance to drink some later. Now, before you pick, I take this one (10 with less) and pour it into this one (taller graduate), and I take this one (10 with more) and pour it into this one (shorter graduate). Now look at them. (Pause) If you can show me the one with more to drink, I'll give it to you to drink.

_____ Picks correct short graduate (ask Q below)

_____ Picks incorrect tall graduate (ask Q below)
Did you pick the one with more to drink?

(Let child drink)



a. (Two 10 ml beakers and 5 ml graduate)
Now let's fill these two glasses. Now I fill this glass (one of the 10's) up to the very top. I don't fill this (other 10) glass up. Now, see, I put more coke in one glass than the other. Can you see that one glass has more coke?

______ Yes

______ No

When I say so, you can pick the one with more to drink. If you don't pick the one with more to drink, you son't get any this time, but you'll get another chance to drink some later. Now, before you pick, I take this one (10 with lesser amount) and pour the coke all out into this one (graduate). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

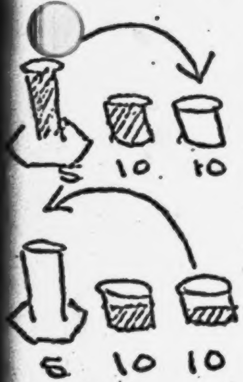
______ Picks correct beaker (Let child drink)

______ Picks incorrect graduate (go to Q4)

4. (If picked incorrect graduate:) Which one had more before I poured it?

______ Correct 10 with coke

______ Incorrect empty 10



See, this one (point to beaker) has more coke in it. This one (point to graduate) has less. See (pouring graduate back into beaker), it's less. Then this (pointing to beaker with more) has more. Now I pour it back (pour from beaker with less into graduate). Now look at them. (Pause). Now, you take the one with more coke to dring.

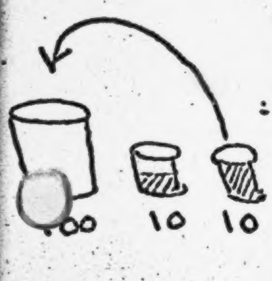
______ Picks correct beaker (Let child drink)

______ Picks incorrect graduate (Ask Q following)
Does it really get to be more to drink when I put it in here (point to graduate)?

How does that happen?

(Let child drink his choice.)

5. (If picked incorrect 10 ml beaker on Q 1:)



Two 10 ml beakers and one 100 ml beaker)
Now let's put some coke in these galsses. (Pour coke in both 10 ml beakers with more in one.) You don't need to show me, but can you see that I put more coke in one glass than the other?

______ Yes

______ No

When I say so, you can pick the bigger one to drink. If you don't pick the one with more to drink, you won't get any this time. Now, before you pick, I take this one (10 with more) and pour the coke all out into this one (100 ml beaker). Now look at them. (Pause). If you can show me the one with more to drink, I'll give it to you to drink.

______ Picks incorrect 10 (Go to Q 6)

______ Picks correct 100 (Ask Q's below)

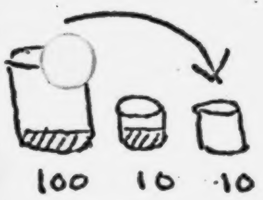
How could you tell?

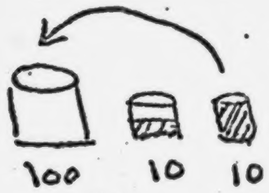
(If say empty had more): But how could you tell when it's like this (point to 100)?

(Let child drink and terminate test)

6. (If picked incorrect 10 or Q5:)

Which one had more before I poured it here (point to 100)?





______ Correct empty 10

______ Incorrect 10 with less

See, this one (point to 10 with less coke) has less to drink. See, (pouring coke from 100 ml beaker back into 10 ml beaker) this is more. Now, I pour it back (pour from 10 with more into 100). Now look at them. (Pause). Now, you take the one with more coke to drink.

______ Picks correct 100 (Let child drink).

______ Picks incorrect 10 (Ask Q's below)

Does it really get to be less to drink when I put it in here?

How does that happen?

(Let child drink his choice.)

PRE-SCHOOL PROJECT, Summer 1967

code sex age date tester

Materials: 4 brown M&M's, 1 white mint

1. Look, here is some candy. Some are chocolate candy, (give child an extra chocolate M&M to eat). One is mint candy (give child extra mint to eat).

Are these chocolate candy? Yes No
Is this mint candy? Yes No

Now I'm going to have you pick some, and you must pick the most you can. If you don't pick what has more to eat, you won't get any candy this time. Now, pick either all the chocolate or all the candy. Which has more to eat?

Candy Chocolate

Why did you pick that?

Which are there more of, chocolate or candy?

Why is that?

2. Put all the candy in my hand. Correct Incorrect

Put all the chocolate in my hand. Correct Incorrect

3. Is all the candy chocolate? Correct No Incorrect Yes

Is all the candy mint? Correct NO Incorrect Yes

Is some of the candy chocolate? Correct Yes Incorrect No

Is some of the candy mint? Correct Yes Incorrect No

4. a. Now, listen carefully. If you took some of the chocolate away, would there be any chocolate left?

Yes No

b. If you took all of the chocolate away, would there be any chocolate left?

Yes No

c. If you took all the chocolate away, would there be any candy left?

Yes No

d. If you took all of the candy away, would there be any chocolate left?

Yes No

5. Then is there more candy or more chocolate?

Why do you say there is more__________________________?

6. What kind of candy is here?

7. You take either all the candy or all the chocolate, whichever is more.

All Candy	Chocolate	Mint

Dream Interview

Code Sex Age Date tester

Introduction:

"You know what a dream is, don't you? Do you dream sometimes during the might?"

"Can you have a dream if you stay awake and don't go to sleep?"

(If he says he does not dream, go on to 5)

(If he says he dreams, ask:)

"What did you dream about last time: tell me a dream you had."

"What happened after the dream was over? What did you think and do?"

3. a. "What happened to the (object) after you woke up? Where did it go; where was it after you woke up?"

(If it disappeared ask:) "Could you see it leaving?"

(If it hadn't disappeared ask:) "Could you see it when you woke up?"

"When you see a dog in a dream, is it the same as when you are awake at night and see a dog?"

2. a. What is this? (picture of a dog)____________________

Is this a real dog you see here, or is it a picture, just something that looks like a dog?

(If real:) Can this dog you see here bark or run?

3. c. Was the (object_________) you saw in your dream just pretend, just something that looked like a (object), or was it a real (object)?

3. d. Was the (object) in your dream really there where you wece really close to you, or did it just seem to be there?

(If really there:) Could you touch the (object) and (smell, or other appropriate sense) it?

5. The Origin of the Dream

"Tell me, where does a dream come from?"

"Where are dreams made, where do they come from?"

"Do they come from inside you or outside of you?"

"Who makes the dreams come out?"

"Is it you or is it somebody else?"

6. Location of the Dream

"While you are dreaming, where is your dream, where does it go?"

"Is it inside of you or in your room?"

(If the dream is in the head, in the thoughts, etc. (thus internal and not external) say:)

"If we could open your head while you are dreaming, if we could look into your head, could we see your dream?"

If not, why do you say that we could not see your dream?"

7. (If the dream is in the room on the wall, close to his eyes, under the bed, etc., say:)

"Is it only that the dream seems to be in your room or is it really in your room?"

If not really in room: "Where is the dream then?"

4. "If your mother is in your room while you are asleep and dreaming, can she also see your dream?"

Why not?

(If not): "How about me--could I see your dream if I were in your room while you were dreaming?"

8. Substance of the Dream

"What is a dream made of?"

"Is it made of paper?"

"Then, what is it made of?"

"Can we touch dreams?"

"Is a dream a thought or is it a thing?"

(If he says he didn't dream at beginning, return now to introduction and ask again to tell about a dream he had.)
10. (If the child still says he did not dream, ask him:)

"Let's make believe that you dream during the night about a monkey. Would it just seem that the monkey was there,or would the monkey really be there?"

"Let's make believe you dream about a monkey during the night. What would make you dream about thet, why would you have that dream?"

"Then do you know why we dream, why there are dreams?"

9. "When you had the dream about the (object), why did you have that dream? What made you have that dream?"

"Then do you know why we dream, why there are dreams?"

Scale Score
1. Know what a dream is.
2. Says picture of dog is not real
3. Dream object is not real
   a. partly aware of unreality of dream
   b. fully aware that dream is not real and consistent in saying this.
4. Dreams are not visible to others.
5. Dreams do not originate in the external physical world.
6. Thinks dreams may take place inside.
7. Sure dreams take place inside.
8. Dreams are not material things.
9. Dreams are caused in a purely subjective or immaterial fashion by the child himself.

DREAM INTERVIEW SCORING

1 KNOWS WHAT A DREAM IS

+ YES, knows what a dream is
can't have a dream if stay awake and don't go to sleep
can have a dream if awake, but differentiates as daydream

2 PICTURE OF DOG IS NOT REAL

+ just a picture or something that looks like a dog
real picture of a dog
real dog, but can't bark or run Q2

- real dog, can bark and run

3a PARTLY AWARE OF UNREALITY OF DREAM

unclear or inconsistent about dream object

+ Q 3a or 3b or 3c : one answer that dream object is not real

3b FULLY AWARE THAT DREAM IS NOT REAL

fully clear that actions or objects of the dream are not really there

+ 3c pretend or look-like object
3d just seemed to be there
3a no - responses Q3

- 3c real object
3d really there
3a suggests place where object went: UNLESS object is really in existence

4 DREAM NOT VISIBLE TO OTHERS

+ no, mother can't see dream Q4
no, I can't (ie E) see dream
(+ if both are +, or if only one is answered and it is +)

5 DREAMS DO NOT ORIGINATE IN THE EXTERNAL WORLD

+ (if both a and b are +, or if only one is given but is +)
a from you; from some part of the body; dreamland; God; heaven; or don't know if + on b Q5 (Where are dreams made, where do they come from?)

b inside on Q 5 (Do dreams come from inside or outside?) unless has said God or dreamland in a.

- a from the night, from windows, d.k.

b outside UNLESS God or dreamland in a

6 THINKS DREAMS MAY TAKE PLACE INSIDE

+ (if + on two of the following)

a head; you; mind; some part of body on Q6 (While you are dreaming, where is your dream, where does it go?)

b inside on Q6 (Is it inside you or in your room?)

c seems to be there on Q6 (Does it seem to be in your room or is it really there?)

d internal locus on Q7 (Where is your dream then?)

7 SURE DREAMS TAKE PLACE INSIDE

+ (Replies correctly to all questions about the location of the dream, where it takes place. May believe that dreams come from God or heaven, but if so, believes that the dream goes inside the body or head before its occurrance.)

8 DREAMS ARE NOT MATERIAL THINGS

+ a no concrete physical substance named on "What are dreams made of?"
b no-dreams made of paper
c no-touch dreams
d thought-thought or thing
e no-open head, see dream
f invisible or some similar response to "Why do you say you could see dream?"

- if d.k., yes, or maybe, or if any incorrect response to above.

9 DREAMS ARE CAUSED IN A PURELY SUBJECTIVE OR IMMATERIAL FASHION BY THE CHILD HIMSELF

+ you do, your mind, some stimulus event of child on Q "Who makes dreams come out?"
you on Q ("Is it you or somebody else?"
some explanation of having perceived or heard about the dreamed about object and some explanation of its having made an emotional impression on the child, or is said to be something the child is thinking about. A simple statement that the child has seen the dreamed about thing is inadequate.

- God makes dreams come and child has nothing to do with it

Name ______________________________

Object Sorting Task

Equipment: Randomly arranged cluster of 3 infants, 3 fathers, 3 mothers, 3 boys, 3 girls (1 rubber, 2 identical cloth for each set)

1. "Put them in order, put the ones together that go together." (After grouping:) "Why do they go together?" (Require at least five groupings — record each group and reason group goes together.)

   a. (If most groupings are associative:) "Put the ones that are the same together here."

2. (Human dolls are now collected and mixed. Two pieces of paper are set out.)

"Now make just two piles out of all the dolls. Put some of the dolls here and some of them there. Put all the ones that are the same, that go together, here. Put all the other ones that go together, that are the same, over here." (Record dolls in each group.)

a. (If child is uncertain or does not respond to above:) "We're going to take all these dolls that are together and make two piles out of them. Let's take this boy doll and put it on the paper. Now put all the other ones that go with the boy on this paper. Put the other ones that go together on this paper over here." (Record dolls in each group.)

Non-verbal Scoring Procedure

All object sorts must be scored without reference to the child's verbalization. For spontaneous sorting, page 1, one credit is given for each sort. If "same" directions were given on page 1, one-half credit is given for each sort. When a child kept adding objects to the sort the final sort is scored unless regrouping occurred at very different times in the protocol as when the child completely resorts spontaneously. The following rules apply to spontaneous sorts.

Categorical. -- At least three objects must be in a group for it to be scored categorical. The following groups are scored categorical:

3 babies
3 girls
3 women
3 boys
3 men
4 women: 2 rubber and 2 plastic
4 men: 2 rubber and 2 plastic
5 children
6 children
5 adults
6 adults
5 females
6 females
5 males
6 males

Part-categorical. -- Two dissimilar same sex and age (e.g., plastic and rubber girl) is scored $\frac{1}{2}$ associative, $\frac{1}{2}$ categorical.

4 rubber children, scored $\frac{1}{2}$ descriptive, $\frac{1}{2}$ categorical
4 rubber adults, scored $\frac{1}{2}$ descriptive, $\frac{1}{2}$ categorical
2 plastic males and rubber male, scored $\frac{1}{2}$ identity, $\frac{1}{2}$ categorical
2 rubber women and plastic girl, scored $\frac{1}{2}$ identity, $\frac{1}{2}$ categorical

Collective. -- A collective sort is the making of a family group. In order to be scored collective a sort must include at least a mother, a father, and a child. It cannot include more than one set of adults.

Descriptive. -- A descriptive sort is one in which an obvious perceptual similarity exists between the objects. This dan be on the basis of color or materials. The following groups are scored descriptive:

All plastic dolls with or withour baby
All rubber dolls with or without babies
Dolls dressed in red checks together
Blond hair girl and blond hair boy
Brown hair boy and brown hair girl

Descriptive - continued

Brown hair man and brown hair woman
Pink plastic girl and pink baby

Identity. -- Identity groupings are those in which two nearly identical objects are put together. The following sorts are scored as identity:

2 rubber same sex and age dolls
2 same sex plastic dolls
2 rubber babies
Any doll alone which is sorted to be alone, not just left over

Scoring for the forced sort dichotomy is as above with the following exceptions:

Placement of the baby dolls should be ignored in a sex sort and scored categorical if all other dolls are by sex.

In age sort babies must be with children for categorical.

By sex or by age is scored categorical.

Scoring of Verbalizations

The procedure developed by Kohlberg was followed with the following exceptions:

An enumerative response is associative even if description of the dolls is included when there is no common attribute. For example, "This is blue and yellow, this is red and green." Or, "This is big and this is little."

When the child says the dolls are the "same" or "look alike" this is scored Identity.

When a child names a group "boys and men" or "ladies and girls" this is scored $\frac{1}{2}$ associative, $\frac{1}{2}$ categorical as it is not clear if male-female concept is present. This response ordinarily should be probed further.

Score Sheet

	Non-Verbal		Verbalization	
	No.	%	No.	%
Associative				
Identity				
Descriptive				
Collective				
Categorical				
Total				
Weighted Score				

Sorting Scale

1. Makes some similarity groupings spontaneously or on request (1a).
2. Most groupings are not associational.
3. Includes all objects.
4. Includes all members of a class in more than 50% of spontaneous groupings.
5. Uses complementary classes in 2.
6. More than 50% of weighted groupings are true categorical concepts.
7. Scores 3 on class inclusion task.
8. Shifts from one system of classification in spontaneous groupings to another in forced sort, e.g., from sex groupings to age groupings.

F. Socialization into the role of pupil

Principal Investigators: Virginia C. Shipman and Robert D. Hess

Although socialization theory has provided a useful conceptual framework for research on the emergence of affect, aggression and other forms of social behavior in children, its relevance for understanding the development of cognitive functioning has not been equally exploited.

Considering the mother as the primary socializing agent for the preschool child, the present investigators have studied the influence on educability of the nature of the relationship and modes of communication that develop between the urban Negro mother and her child. Educability is here considered not only to include the cognitive skills and modes of problem solving the child brings to the school situation but also his motivation for achievement and modes for relating to the authority figures in that situation.

In our study of the cognitive environments of urban preschool children we found that children from deprived backgrounds not only are likely to come to school without the skills needed for absorbing kindergarten or first grade work but also that their early orientation toward the school is often dysfunctional, interfering with the child's attempt to meet the school's demands and its attempts to reach and motivate him.

The effects of early experience are not only to form communication modes and cognitive structure; they also establish potential patterns of relationship with the external world. The preschool experience of the working class child develops patterns of responsive behavior and ways of relating to the authority structure of the school which often are not adaptive for academic learning and prevent him from taking advantage of the cognitive experiences available in the classroom. His lack of preparation is not merely a matter of level of knowledge but represents orientations to authority, the school, and the learning process that have been learned in the child's preschool experience and are constantly reinforced by his home and community environment.

The mother's mode of dealing with her child and with the school affects the educability of the child by teaching him ways of dealing with the school as a social system. The images that the mother holds of the school and that are probably transmitted to the young child in some form are particularly relevant for early education and the child's success in school. Although there was considerable variability within social status groups in their responses, and a great deal of overlap between social status groups, we found that working class mothers tend to perceive the public school as an institution that is distant, competent, authoritarian, and unresponsive. This attitude may be paraphrased as follows: in contrast to middle class mothers, those from the working class believe they can do little to improve the schools; that learning is not natural, but that children must be forced to learn; that if they disagree with the school principal, there is little they can do. Their attitudes reveal the sense of futility, powerlessness, and the lack of alternate routes of action open to lower class families in their dealings with the school system. They also reveal an impression of the learning process as difficult, without intrinsic motivation, and as necessarily involving status and power pressure upon children.

In attempting to apply Bernstein's concept of status-oriented and person-oriented families to our data, we analyzed maternal responses to the question: Imagine your child is old enough to go to public school for the first time. How would you prepare him? What would you tell him?

The status-oriented (or imperative) mother emphasizes the difference in status and power between the child and the teacher and offers compliance and docility as techniques for dealing with the classroom situation. The instructive (or person-oriented) mother sees less distance between herself and the school and thus is less concerned with obedience. She attempts to explain the school in terms of the rationale of the system (if you don't get to school on time, you won't learn as much; if you aren't quiet, you can't hear what the teacher says; the teacher is like your mother -- she wants to teach you and help you), making it possible for the child to evaluate and respond to events and demands in terms of a logic that can be applied to new situations. The imperative or status-oriented child responds to the fixed structure of the school and may be unable to adapt to more subtle or complex patterns of stimuli. For him, security lies in compliance and docility. The person or instructive-oriented child is made aware of more alternative and possibilities of interaction. His security lies in understanding why rules are enforced and thus, presumably, he is able to recognize situations in which rules may be suspended for other considerations. This permits him to initiate action, to anticipate response in new situations, and to explore the unfamiliar more comfortably.

If the general line of argument presented here is valid, a significant correlation should exist between the pattern of regulatory behavior by the mother and cognitive performance of the child. The effect is implicit in the description of the different control types: children of mothers who use imperative-normative control will generally perform at a lower level than children of mothers oriented toward inner, subjective states and rationale. In addition, the relationships these children establish with adults other than their mothers, e.g., testers, teachers, will reflect the regulatory system established between the mother and child.

In our study of urban Negro mothers and their four-year-olds, we found the tendency for mothers to use imperative-normative regulatory techniques associated with the child's low performance in several areas. First, there was a significant negative correlation between imperative responses on the First Day protocols and Stanford-Binet I.Q.s. Also, mothers with high imperative scores had children who gave nonverbal responses on the Sigel Sorting Task and were unable or unwilling to offer verbal rationales for their sorts in the interaction sessions. Moreover, we found that even within the more restricted range of responses given by the low-income groups, the mother's feeling of powerlessness in dealing with the school was a significant predictor of her child's I.Q. and his behavior in the testing situation.

The present study was an attempt to replicate these findings with similar and diverse low-income populations. The subjects were the mothers or principal maternal caretakers of the children in our evaluation sample. This sample consisted of urban and rural Negro and white families, plus an additional group of Seminole Indian mothers from an urban and rural reservation.

All subjects were interviewed by E and R Center staff at the time of the administration of the OEO Parent Interview Questionnaire. The research questions followed the OEO Questionnaire and may be found in the Appendix. In the case of the Indian sample, a member from the respective reservation accompanied the interviewer in order to translate items where necessary.

The following predictions were made concerning the low-income mother's response.

1. On the First Day Task there will be a predominant use of status-oriented messages and imperative, rather than instructive, statements. Obedience rather than learning will be stressed.
2. Distance between the school and home will be reflected in feelings of powerlessness in dealing with school personnel.
3. Despite the social changes which have occurred over the past few years, there will be considerable discrepancy between the mothers' aspirations and expectations concerning how far their children will go in school.

In addition, we expected sufficient variation within the sample on these measures to be able to make the following predictions.

4. There will be significant negative correlations between the percentage of imperative and status-oriented messages with the child's pre-Binet I.Q.
5. Both level of aspiration and expectation for her child's educational achievement will be positively associated with pre-Binet I.Q.
6. The mother's non-participation in groups, reflecting her isolation and reduced sources of indirect social stimulation for her child, will be positively associated with lower pre-Binet I.Q.s.
7. Younger age expectancies for the Winterbottom items will be positively associated with pre-Binet I.Q.s.
8. These maternal behaviors will be significantly related to the child's post-Binet I.Q. and degree of change in intelligence

> test performance. However, since these scores also reflect differences in the Head Start experiences of these youngsters, the correlations will be expected to be lower.

Since these interviews were collected in the summer, coding did not begin until the fall. All data have now been scored, checked, and put on IBM cards. Analyses of the data, however, have just begun. During the next month we will determine the extent of confirmation of the above hypotheses in addition to analyzing similarities and differences in subsample groups.

Preliminary results indicate that on the First Day Task low-income mothers from various ethnic groups tend to stress obedience rather than learning in school, and that they tend to present their children with a minimum of rationale for their expected behavior. Also, significant relationships are obtained between both the mother's level of aspiration and expectation and her child's pre- and post-Binet I.Q.s. Urban white and Negro mothers show higher mean levels of aspiration and expectation concerning how far their children will go in school. On the Winterbottom items higher mean age expectancies for the various achievement behaviors tend to be associated with lower Binet I.Q.s, but usually not to a statistically significant degree. There is considerable variation both between and within groups for these age expectancies.

These data are congruent with our argument that social class and cultural effects upon cognitive development of children can best be understood in terms of the specifics of interaction transactions between the mother and her young child, that the nature of these exchanges is influenced by the family's position in the social structure of the community and the availability of alternatives open for consideration, that maternal behavior induces complementary learning or information-processing strategies in the child and that the child's early orientation to authority and cognitive activity facilitates or retards his ability to adopt the role of pupil when he encounters formal learning situations in the public schools.

UNIVERSITY OF CHICAGO HEAD START E AND R CENTER
1966-67
PARENT INTERVIEW SUPPLEMENT

FIRST DAY OF SCHOOL QUESTION:

Let's just imagine that ________ is old enough to go to grade school for the first time. How do you think you would prepare him/her? What would you do or tell him/her?

(Record verbatim): Probe without giving suggestions as far as possible. If it doesn't come out spontaneously, be sure to ask "What will you tell him/her about that first day at school?"

MOTHER'S REACTION TO CHILD'S QUESTIONS:

What do you do if __________ asks you a question that you don't want to answer?

(Record verbatim)

EDUCATIONAL ASPIRATIONS AND EXPECTATIONS:

(A) If you could have your wish, and _______ had the opportunity, how far in school would you like for (the child) to go?

(Check highest answer that applies)

1______Finish Grade School

2______Attend Junior High School

3______Finish High School

4______Take Vocational Work in High School

5______Take Vocational Work After High School

6______Go to College

7______Finish College

8______Go to Graduate School

9______Don't Know

(B) Since things don't always turn out the way we want them, how far do you think ___________ will probably or actually go in school?

(Check highest answer that applies)

1______Finish Grade School

2______Attend Junior High School

3______Finish High School

4______Take Vocational Work in High School

5______Take Vocational Work After High School

6______Go to College

7______Finish College

8______Go to Graduate School

9______Don't Know

Difference between aspirations and expectation level (0-8)

MOTHER'S ACTIVITIES

What groups do you belong to or attend meetings?

(Write the name of the club, what the group does and how involved the subject is in the group; 1 = very active, 2 = active, 3 = member, 4 = non-member, 5 = none)

NAME OF GROUP	PURPOSE	INVOLVEMENT
1.__________		
2.__________		
3.__________		
4.__________		
5.__________		

SOCIAL - EMOTIONAL CHARACTERISTICS OF CHILD:

Young children are often afraid of different things. Is________overly afraid of:

A. DARKNESS?

1.____Very often

2.____Occasionally

3.____Never

4.____Don't Know

5.____No information

B. THUNDER AND LIGHTENING?

1___Very often

2___Occasionally

3___Never

4___Don't Know

5___No information

C. HURTING HIMSELF BY FALLING?

1.____Very often

2.____Occasionally

3.____Never

4.____Don't Know

5.____No information

D. SIRENS OR OTHER LOUD NOISES?

1___Very often

2___Occasionally

3___Never

4___Don't Know

5___No information

E. DOGS?

1.____Very often

2.____Occasionally

3.____Never

4.____Don't Know

5.____No information

F. DOCTORS?

1___Very often

2___Occasionally

3___Never

4___Don't Know

5___No information

G. OTHER STRANGERS?

1.____Very often

2.____Occasionally

3.____Never

4.____Don't know

5.____No information

H. BEING SEPARATED FROM YOU?
(left with sitter, leaving for school,etc.
1___Very often

2___Occasionally

3___Never

4___Don't Know

5___No information

AGES FOR INDEPENDENCE EXPECTATIONS:

When do you think your child will be old enough to do things like: (enter age)

1______Undress himself and go to bed by himself?

2______Hang up his own clothes and look after his own possessions?

3______Make his own friends among children his own age?

4______Eat alone without help in cutting and handling food?

5______Do some regular tasks around the house?

6______Stand up for his own rights with other children?

7______Read stories alone without your help?

8______Take part in your adult interests and conversations?

9______Earn his own spending money?

10______Make decisions like choosing his clothes or deciding how to spend his money by him/her self?

Then ask: Are there any of these (child) is doing now?
(Circle number of appropriate item(s) above)

EDUCATIONAL ATTITUDE SURVEY

	1 Strongly Agree	2 Agree	3 Don't Know	4 Disagree	5 Strongly Disagree
1. The teachers expect the children always to obey them.					
2. The only way that people can raise the way they live is to get a good education					
3. Most teachers probably like quiet children better than active ones.					
4. The best way to improve the schools is to integrate them.					
5. I can do very little to improve the schools.					
6. The classrooms are overcrowded.					
7. What they teach the kids is out-of-date.					
8. Most teachers do not want to be bothered by parents coming to see them.					
9. Sports and games take up too much time.					
10. Kids cut up so much that teachers can't teach.					
11. Not enough time is spent learning reading, writing, and arithmetic.					
12. There are some children in the school I would not want my child to play with					

	1 Strongly Agree	2 Agree	3 Don't Know	4 Disagree	5 Strongly Disagree
13. People who don't have much education enjoy life just as much as well educated people.					
14. The law should be changed so that boys and girls would have to stay in school until they completed high school.					
15. In school there are more important things than getting good grades.					
16. The best way to improve the schools is to train teachers better.					
17. Once in a while it should be OK for parents to keep their children out of school to help out at home.					
18. Teachers who are very friendly are not able to control the children.					
19. The teachers make the children doubt and question things that they are told at home.					
20. Most teachers would be good examples for my children.					
21. When children do not work hard in school, the parents are to blame.					
22. The most important quality of a real man is driving purpose to get ahead.					
23. Most kids who can do the work are able to get to college if they really want to.					

	1 Strongly Agree	2 Agree	3 Don't Know	4 Disagree	5 Strongly Disagree
24. A man can often learn more on a job than he can in school.					
25. Most children have to be made to learn.					
26. If I disagree with the principal, there is very little I can do.					
27. Most of the teachers are not trained as well as they should be.					

1. Circle one: Sex: M (1) F (2)

2. Years of formal education completed:______________________

3. Occupation of the head of your household or family (you, your husband, or your father

____

Title Kind of Work

4. Your age:_______

5. Do you have children in school? (circle one) Yes (1) No (2)

6. Do you have 3-6 year old children (circle one) Yes (1) No (2)

How Many____________

7. If "yes" to #6, do you plan to send him (her/them) to:

_____1. A Chicago public school

_____2. A religious school

_____3. A private school (other than religious)

_____4. Other

_____5. Don't know

NAME OF SCHOOL ADDRESS